The Milbank Memorial Fund

QUARTERLY

JULY 1957

TWENTY-FIVE CENTS

VOL. XXXV
NO. 3

The Milbank Memorial Fund

QUARTERLY

CONTENTS

	Page
In This Issue	243
Social Barriers to Optimal Health — *Matthew Tayback, SC.D*	245
The Age for Neuroses — *Michael Shepherd, M.D., and E. M. Gruenberg, M.D.*	258
The Differential Fertility of the Negro Population, Houston, Texas, 1940–1950 — *Jack E. Dodson*	266
Median Age at First Marriage in Sweden, 1881–1953 — *Rollin Chambliss*	280
Some Sources of Variation in the Family Size of College Graduates — *Robert Gutman and Irving Bender*	287
Annotations	
Age Distribution as Affected by Changes in Fertility and Mortality —A Further Note — *Ansley J. Coale*	302
Vital Trends and Age Distribution: An Added Note — *George J. Stolnitz*	307
Population Theory and Policy — *Hope Layton Furth*	309
Social Characteristics of Urban and Rural Communities 1950 — *Adrienne P. Haine*	313

Vol. XXXV JULY 1957 No. 3

Edited by the Technical Staff

Published quarterly by the MILBANK MEMORIAL FUND, 40 Wall St., New York 5, New York. Printed in the U.S.A. Subscription: $1.00 a year.

Entered as second-class matter at the Post Office at New York, N.Y., April 20, 1956, under the Act of March 8, 1879. Additional entry as second-class matter at the Post Office at Lancaster, Pa.

IN THIS ISSUE

In the paper "Social Barriers to Optimal Health," Matthew Tayback of the Baltimore City Health Department discusses ways in which social attitudes, values, and behavioral patterns interfere with preventive health programs that could raise levels of health in the population. Action for the prevention of the most urgent current health problems, such as heart disease, arteriosclerosis, cancer, and mental disorders, is dependent on individual patterns of behavior and cultural values relating to health, whereas prevention of disease in the past has been accomplished largely through immunization and control of the external physical environment. In developing programs for promotion of the health of adults and of our aging population, Dr. Tayback suggests that the public health worker should consider the contribution that can be made by the sociologist and social worker.

• • •

In an article entitled "The Age for Neuroses," Dr. I. M. Shepherd, of the Institute of Psychiatry, Maudsley Hospital, London, and Dr. E. M. Gruenberg, of the Milbank Memorial Fund, have assembled data relating to age-specific prevalence and incidence of neuroses. The age curve for new cases and that for all diagnosed cases at a given time both rise rapidly during early adult life and then decline at older ages. The authors point out that the limited evidence available suggests that neurotic illnesses are characteristic of a particular period of the life span and are, in the mass, of short duration. The need for study of the age of onset and duration of neurotic illness is emphasized.

• • •

"The Differential Fertility of the Negro Population, Houston, Texas, 1940–1950" is the subject of a paper prepared by Professor Jack E. Dodson of the Texas College of Arts and Industries. The data were derived from the Bureau of Vital Statistics, Houston Department of Health. The author discusses 1940–1950 trends in general and marital fertility in Houston by age, color, birth order, and socio-economic status. A valuable feature of the analysis is a subdivision of the whites into "Latin White" and "Anglo-White" components. The former are those with Spanish surnames.

• • •

The trend toward earlier marriages since 1940 has been evident in many countries. It has been particularly marked in the United States and Sweden. Sweden's vital statistics originated in the parish records system many years ago. Since 1881 the statistics on marriage have been published periodically for the country as a whole. Professor Rollin Chambliss of the University of Georgia has computed the median ages at first marriage of males and females for each year since 1881 and the results appear in his article "Median Age at First Marriage in Sweden, 1881–1953." Over the long period 1881–1940 there was not much change in the median age at marriage. Since 1940 there has been a steep decline in age at marriage for both sexes and the sex differential in median age at first marriage has been maintained.

• • •

In an article "Some Sources of Variation in the Family Size of College Graduates," Professors Robert Gutman and Irving Bender of Dartmouth College present the results from their recent follow-up study of 101 men who graduated from an Ivy League College in 1940. The design of this study is unique. Professor Bender, a psychologist, first selected the subjects for study while they were seniors and collected much data from them in connection with his interest in the relation between certain visual and psychological factors. Fifteen years later Professors Gutman and Bender collaborated in a mailed questionnaire follow-up study which included questions regarding occupation, marriage, number of children, and others.

SOCIAL BARRIERS TO OPTIMAL HEALTH[1]

MATTHEW TAYBACK, SC.D.[2]

IN the course of charting the direction which the health of a community is taking, the public health statistician will be in receipt of the widest range of facts, of variable precision and accuracy, and relating to the extent of illness in the area under his observation. Mindful of the prior history of specific diseases in a given locale, he will evaluate the information within his possession, in an effort to point out new and desirable efforts to achieve those health objectives considered reasonable of attainment in this day and age. As control of certain diseases is successfully reached, he is led to catalogue the rationale and methods which contributed to these accomplishments. And when lack of success is the outcome of a planned expenditure of effort, he has reason to reflect on the nature of the obstacles which impede progress. Perhaps with this brief introduction you may appreciate the circumstances which underlie the choice of subject matter, one which, at first glance, would seem far astray for a biostatistician to cover.

By the term "social" one has in mind the concept of person to person relationships as contrasted, say, with relationships between persons and the physical aspects of their environment, the air they breathe, the water they drink, the temperature of the region in which they live, etc. The social characteristics of a group of individuals, whether it be a family, a neighborhood, or some other population segment have reference to attitudes, values, and behavioral patterns which are transmitted from person to person in the course of daily contact. "Optimal health" infers the highest level in physical, mental and social well being which an individual can attain in the light of current knowledge on the control of disability.

[1] Paper presented at the 20th Annual Meeting of the Mississippi Public Health Association, December 5, 1956. This is paper No. 316 of the Department of Biostatistics, the Johns Hopkins School of Hygiene and Public Health.

[2] Assistant Commissioner of Health for Research and Planning, Baltimore City Health Department. Research Associate, the Johns Hopkins School of Hygiene and Public Health.

The thesis which I propose to discuss in this paper is that these social attributes are in many instances an essential part of the framework within which the health worker must play his role. They may serve to facilitate the operation of a program for the promotion of health or contrariwise may severely hinder the progress of such work. It is well, therefore, to consider those aspects of the social milieu which serve as obstacles to the attainment of optimal health. In this way, one may come to understand the limitations which are imposed upon the goals one may expect to reach or one may avoid failure by adjusting a program of action to conform to the existing social structure or one may elect to modify the components of the social structure which are critical obstacles towards the attainment of a health objective and which do not otherwise contribute in a positive manner to the welfare of the group.

The approach, thus outlined, becomes increasingly relevant as public health workers concern themselves with programs designed to minimize illness and disability from chronic disease, as they delineate their responsibility in the promotion of mental health, and as health officials are called upon to contribute to the planning of sound programs for the growing numbers of aged members in our population.

Chadwick and Social Factors in Health

Recognition of the importance of cultural patterns upon the health of a community may be found in the prophetic reports of Chadwick, Farr, and Shattuck. The attention which this relationship has been given by these great public health thinkers serves to underline the fundamental nature of this argument. For example, you will find in the Inquiry into the Sanitary Condition of the Labouring Population of Great Britain (1) a report of the Committee of Physicians and Surgeons at Birmingham wherein the observation is made in connection with family life that the "habit of a manufacturing life (gainful employment) being once established in a woman, she continues it and leaves her home and

children to the care of a neighbor or of a hired child, sometimes only a few years older than her own children, whose services cost her probably as much as she obtains for her labor. To this neglect on the part of their parents is to be traced the death of many children; they are left in the house with a fire before they are old enough to know the danger to which they are exposed and are often dreadfully burnt." The open fireplace may no longer be a threat but should we not consider with some seriousness the sequelae of separation of the pre-school child from close and secure relationship to the mother. Now it may be argued that such issues are primarily economic in nature. But immediately following the passage quoted above, one may find an illuminating contrast of the sanitary condition of families equated as to income but remarkable in the difference in the state of their social well being as determined by the quality of housing, the adequacy of food, and the ability to avoid dependence upon the public exchequer. And on this point, it is further reported "that above a certain amount say 12 shillings or 14 shillings of weekly income, wages alone without intelligence and good habits, contributes nothing towards the comfort, health and independence of the working population." In this famous inquiry into the health of a nation, Chadwick has clearly perceived that the manner in which individuals organize themselves into family units is in itself a significant determinant of the social and mental health of the family members and may also affect their physical health.

A detailed review of the writings of the eminent medical statistician William Farr (2) gives indication of considered thought on the relative importance of the several elements of the community environment which contribute to health or disease. Thus in his study of the factors associated with significant differences between healthy districts and others not so happily disposed he was led to conclude that "the precise degree of influence which the various agencies have in causing the high mortality of towns is not easily determined. Opinions

differ as to what fraction of the suffering and death is to be set down to the want of water or of sewerage; crowded lodgings, narrow streets, ill ventilated workshops, the destitution of skillful medical advice, the neglect of children, doses of opium and quackery."

By and large the modes of response which are group determined have been patterns of behavior which constituted errors of omission in respect to desirable sanitary functions. Perversely enough, socially oriented concepts have led to insistence on health measures which have been useless and indeed harmful. Chapin in a truly refreshing essay entitled "The Fetich of Disinfection" (3) uncovers a social barrier to optimal health and with a tenacity of purpose and unshaking courage proceeds to reorient the force inherent in a belief propagated from one generation to another. In connection with his discussion of the hypothesis that infection is spread chiefly by *things* we find, the statement: "Disinfection had its origin in superstition, and its practice so partakes of the character of magic art that it catches the popular fancy. Even if the health officer does not disinfect, the infected family is likely to sprinkle a little sulphur on the stove, or place a saucer of chloride of lime behind the door. Thus unconsciously do we follow the customs of our remote ancestors who exorcised the demon of disease with incense, and incantation." When confronted with the point of view that although not important, disinfection could do no harm, Chapin argued that the confidence the public placed in the efficacy of disinfection hindered the development of rational methods of controlling disease.

These instances of modes of conduct inconsistent with optimal health standards have been primarily family centered. An example of the manner in which community oriented behavioral patterns have affected individual health is reported by Sydenstricker (4). The fact that pellagra, during early studies of this disease was found to be almost entirely restricted to the southern states, could lead to the obvious conclusion that the geographic character of the South was the decisive factor

in this disease. However, the patient and thorough inquiries of Goldberger and his associates (5) proved otherwise. Within the South, it could be shown that the incidence of pellagra was strongly correlated with family income. One might, therefore, be led to a favorable consideration of the economic factor as the essential explanation for the distribution of pellagra. But income was not the necessary condition.

Families living with low incomes were to be found throughout the country in localities where there was no record of pellagra and this was equally true within the South. Pellagra was found only under certain conditions of food supply and dietary habits. To clearly illustrate this distinction between economic and social determination of departures from health, permit me to describe the clear example cited by Sydenstricker. Two cotton mill villages A and B were very similar in respect to income of the families, occupation of the wage earners, sanitation, the ethnic character of the population, etc. The food supply in A was largely restricted during late winter and spring necessitating use of the mill store or commissary where fresh milk, butter, green vegetables, fresh fruits were in short supply. This deficiency was confirmed by study of the records of food supplies obtained by the population during a sample period. The incidence of pellagra in A village was estimated at ten per cent whereas no pellagra was found in B village, where a plentiful supply of greens and milk products was available the year around. There are few instances in the public health literature which so clearly distinguish the roles which social and economic factors may play in the cause of widespread disease.

We do well to remember that income although associated often with the differential prevalence of a disease, does not in itself provide a sufficient basis for a logical concept of causation and may screen a more meaningful relationship and one with more potential from a disease control point of view.

Social Factors in Current Health Problems

There are significant social factors today which are worthy

of careful evaluation as we seek to achieve a higher standard of health for a widening proportion of the population.

Obstetric Effects of Work. In considering the principal problems which are faced in the area of maternal and child health, prematurity is unquestionably a leading issue. There have been many and diverse investigations in connection with this problem. Biological factors such as maternal age and birth order have been shown to influence the risk of prematurity but the relationships found have not been marked (6). Differences in the prevalence of prematurity have been demonstrated among white mothers who were stratified by socio-economic status—but the order of the difference, 5.5 per cent in the highest economic fifth as contrasted with 7.4 per cent in the lowest economic fifth was not too exciting (7), nor did it lead to a useful concept in respect to minimizing prematurity. It did suggest the need to investigate the possible importance of income related variables such as diet, work during pregnancy and several others.

In the recent literature on the subject, Stewart has found it possible to separate the factor of work during pregnancy from the variable of income (8). For each of three broad income groups it was found that in respect both to perinatal mortality and incidence of prematurity, mothers who worked were at a significant and marked disadvantage as compared with housewives, i.e. mothers who stayed at home, and further, women who continued working in the last trimester of pregnancy were worse off than those who retired relatively early.

During the current era of full employment when young mothers are encouraged to remain active and keep on the job while pregnant, a social form of behavior has developed, which appears to interfere with the highest attainable levels of infant and maternal health.

Sex Standards and Gonorrhea. To one who gives more than cursory attention to the epidemiology of the venereal diseases, the problem of controlling the incidence of gonorrhea in urban areas must be a cause for despair and anguish. By its very

nature, this condition depends for its rate of transmission upon the extent of sexual contacts between different pairs of individuals within a prescribed period of time and upon the prevalence of disease existing at the start of the period. In a community where sex partners are stable in their relationship, the spread of disease will be minimized and the problem becomes one of locating the original foci of disease and the increment which has occurred by transmission through the assumed stable sex relationships. However when the relationships between sex partners in a significant segment of the population is of a transient nature and perhaps of a fortuitous character, the distribution of an original pool of disease can reach geometric proportions. Fortunately we do have control forces which prevent this run-away effect. They appear sufficiently effective to keep the reservoir of infection at a constant size. Stated differently, however, the forces for spreading the disease defeat the efforts made to produce a decline in the amount of new infection which takes place in a given time interval.

A further factor complicating efforts in this endeavor becomes operative as an unfortunate effect of the very therapy we employ to treat gonorrhea—penicillin. When less effective methods were available, a relatively prolonged acute stage of an episode of gonorrhea was likely to prove sufficiently disturbing to prevent a male patient from acting as an effective agent in the dissemination of disease. Penicillin has produced remarkable changes in this respect. The drug rapidly causes a disappearance of symptoms. In a few days the patient can shake off a temporary inconvenience to his random sex conduct and then become a candidate for a subsequent attack. As a matter of fact we have noted instances where individuals have within the space of one year been the subjects of as many as nine defined episodes of gonorrhea. Twenty-five per cent of the infections treated in our clinics within a given year represent repeat episodes in an individual previously treated within the calendar year. The one critical factor which keeps gonorrheal infection at fantastically high levels in urban Negro

populations is the lack of stable sex relationships between young adults. A program for control of gonorrhea within an environment of this nature should clearly recognize the limitations which are imposed by the social standards which prevail. Certainly, involved and expensive attempts to bring individual contacts to treatment, unless practiced on a selected basis, can produce, in the above circumstances only the most insignificant return in reducing the reservoir of infection.

Impediments to Adult Health. Before the turn of this century, the view was widely entertained that disease was a natural phenomenon in the maturation of an individual. As a result, the young child was expected to run the gantlet of summer diarrhea, diphtheria, whooping cough, scarlet fever, etc. The role of the physician was to ease the way of the child over each of these obstacles. Here then was the prevailing attitude towards disease and the role of the physician. Early in the 1900's the germ of a new idea took hold. The concept was formulated that disease was not a necessary component of child development. With this as a working hypothesis, and fortified by rapid strides in bacteriology, a remarkable reorientation took place in medicine as applied to infant and child care and later to maternal care. The prevention of widely prevalent and serious disease became the order of the day. Techniques differed depending upon the disease; systematic health examinations and immunization were the principal tools.

Consider the disbelief and scorn which the "sound" medical thinker must have evidenced in 1900 if he were told that standards of health some years hence would necessitate frequent examinations of an overwhelming percentage of infants during the first year of life and in the absence of illness, and the same would be true for mothers during the entire length of their pregnancy interval. He would wonder where the physicians were who would do such work. Fortunately they were forthcoming.

As we consider the issues involved in promoting a higher standard of health for adults, those same attitudes prevalent

before the start of this century constitute serious barriers to progress. Group attitudes, by and large, lead to the concept that much of chronic illness is a necessary condition of the adult aging process. Socially dictated behavior is such that, in the main, a physician is consulted only in the face of symptomatic illness. And there would appear to be little question but that the general practitioner has not been willing to urge his clientele to plan careful routine physical examination.

I am inclined to believe that sound logic leads to the conclusion that such conditions as arteriosclerosis, arthritis, diabetes cannot, today, be prevented in the same sense as we have been able to accomplish it in respect to diphtheria, smallpox, and pertussis. However, it is not unreasonable to suppose that the time of onset can be delayed and the extent of disability and progress of these diseases can be held to a minimum through systematic health supervision of the adult, including instruction in diet, advice concerning work patterns consistent with the patient's physical condition, diagnosis and treatment of early recognizable departures from health norms and reduction of disability resulting from severe episodes of the disease process.

Some evidence of the difference between community practice in respect to adult health and the standard dictated by logic has recently come to light as a result of the urban and rural surveys by the Commission on Chronic Illness. In the course of the Baltimore Health Survey (9) the state of an individual's health as reported in a household survey, i.e. as he could perceive it, was compared with the diagnoses which were made on the basis of clinical evaluation. It was found possible to accomplish this comparison for some 800 residents of Baltimore City. When one considers that the comparisons made were based upon conditions with symptoms present at the time of household canvass, it is a matter of some seriousness that none of a group of patients with diseases of the prostate was sufficiently aware of the disturbance to report it; 80 per cent of those with cataract, but not blind, were unaware of

their predicament; and some 60 per cent of individuals with hypertensive heart disease were similarly not cognizant of their condition.

The belief that mature individuals can perceive the state of their health with sufficient acumen to infer that they do not depart from norms consistent with optimal standards, has little basis in fact. Thus a social pattern which seeks to restrict medical examination to those instances when the individual can sense illness will tragically deny to large segments of the adult population the benefits of currently developed medical knowledge. It would be naive to presume that once again we were dealing with purely an economic matter. "Remove the financial barrier to systematic adult health supervision and the population will seek medical care in proper time." The experience of the Commission on Chronic Illness indicates otherwise (10). In the Baltimore Health Survey, 7,000 persons aged 17 years and over were invited to a screening clinic in a centrally located office and operated at hours suitable to the convenience of the individuals canvassed. After persistent follow-up including telephone calls and home visits, 2,024 or only 29 per cent, finally were seen in the clinics, even though the examinations were free of charge and transportation was offered when needed. You will note then the difficult hurdles of long held attitudes and beliefs prevalent in the community which must be surmounted before the attainable standards of adult health can be realized by the populations with which we are concerned.

A Note on Problems of the Aged

The aged have been with us throughout the centuries. However, their relative numbers have increased markedly in the past century. Furthermore, profound social and economic changes in the structure of society have served to focus attention on their problems which appear to be as much socially dictated as they are biologically determined. Too often, one is inclined to regard serious degenerative disease as a plague

casting a dark shadow over the older segments of the population. This is a mistaken notion—one of many which bar the way to a fuller life for the aged.

A review of available morbidity data indicates that almost 80 per cent of individuals 65–75 years of age suffer no days of disabling illness, within a given year, due to chronic illness. These relatively well persons are needlessly separated from a productive role in the life of the community by arbitrary retirement practices. In spite of our claims to an enlightened age as compared with past decades, it is a shocking fact that for at least half a century the proportion of men who continue to work after reaching old age has been rapidly decreasing (11). Thus, in 1890, as many as 68 per cent of men, 65 years of age and over, were counted in the labor force. By 1940, this percentage had dropped to 42. Although interrupted somewhat by the war when policy towards employment of the aged was liberalized, the trend of labor force participation rates for men, 65 years and over, resumed its downward course following the war and in 1955 the annual average rate was reported as less than 40 per cent. Within the age group specified above, the proportion of men classified as deriving income from employment dropped from 40 per cent in 1950 to 36 per cent in 1955 (12). Meanwhile the expectancy of life lengthens.

Who can dispute the incongruity of this situation and the serious implications which enforced retirement must have upon the social well being of older persons?

Summary

The manner in which persons aggregate themselves into social entities, families, communities, etc, and by contact with such units acquire attitudes towards work, diet, and other behavioral patterns is a strong determinant of the standard of health which the individual may expect to enjoy. This principle has been recognized by many leading public health thinkers of the past and has as much relevance today as it had, for instance, in Chadwick's day more than a century ago.

The obstetric effects of work during pregnancy, the limitation which is imposed on the control of gonorrhea by widely prevalent promiscuous sex relationships in defined community groups, the resistance of the adult population to seek routine general examination and the reluctance of general practitioners to urge them, and the practice of arbitrary retirement in industry are examples of social barriers to optimal health.

Public health workers have three possible modes of action when faced by situations of this nature. They may recognize the limitations which are imposed by social barriers upon planned objectives and conserve their resources for more fruitful avenues of work. They may mold a program to fit into existing social patterns or they may find it proper to encourage changes in those components of the social structure which interfere with the promotion of optimal health standards and which do not otherwise have positive values for the community.

As the problems of the first half of this century, primarily in the field of communicable disease control, become reduced in stature, new disciplines may become necessary to successfully approach the timely problems of chronic diseases, mental health and those pertaining to a fuller life for our aged persons. The place of the sociologist and the social worker in the planning and implementation of currently developing programs must receive careful consideration. More important is the necessity for public health officials to consider the role which they should play in the planning of the work of social agencies.

References

1. Chadwick, Edwin: An Inquiry into the Sanitary Conditions of the Labouring Population of Great Britain. London, 1842.

2. Farr, William: Vital Statistics. Memorial Volume edited by Noel A. Humphreys. London, 1885.

3. Chapin, Charles V.: Assembled Papers. New York, Commonwealth Fund, 1934.

4. Sydenstricker, Edgar: Health and Environment. New York, McGraw-Hill Co., 1933.

5. Goldberger, J.; Wheeler, G. K., and Sydenstricker, Edgar and others: A Study of Endemic Pellagra in Some Cotton Mill Villages of South Carolina. Hygienic Laboratory Bulletin, No. 153, Washington, United States Public Health Service, 1929.

6. Tayback, Matthew: Birthweight and Length of Gestation with Relation to Prematurity, *Journal of American Medical Association*, July 7, 1951, 146, pp. 897–901.

7. Rider, R. V.; Tayback, M.; and Knobloch, Hilda: Association between Premature Birth and Socio-Economic Status. *American Journal of Public Health*, August, 1955, 45, 8.

8. Stewart, Alice: A Note on the Obstetric Effects of Work During Pregnancy. *British Journal of Preventive and Social Medicine*, July, 1955, 9, 3.

9. Commission on Chronic Illness: Baltimore Health Survey. Unpublished. Data on file at Johns Hopkins School of Hygiene and Public Health.

10. Roberts, C. M. and Wylie, C. B.: Multiple Screening in the Baltimore Study of Chronic Illness. *Journal of American Medical Association*, August, 1956, 161, 15.

11. Federal Security Agency: MAN AND HIS YEARS. Health Publications Institute, 1951.

12. Economic Resources of Persons Aged 65 and Over. *Social Security Bulletin*, June, 1955, 18, 6.

THE AGE FOR NEUROSES

MICHAEL SHEPHERD, M.D.,[1] AND E. M. GRUENBERG, M.D.[2]

ALTHOUGH known to occur at almost any age, and to have variable durations (1, 2), clinical psychoneuroses appear to be particularly characteristic of that period of the life span sometimes referred to as early maturity. The age of onset and the course run by psychoneuroses in the absence of treatment have rarely been studied and psychiatric literature, even in this period of scientific medicine, rarely tries to clarify these features of the natural history of neuroses.

Noyes' textbook statement that ". . . most neuroses of adults develop between adolescence and 35 years of age" (3) represents a widely held belief among clinicians.

Direct evidence regarding the age of onset of "most neuroses," however, is not available. Most of the indirect evidence tends to confirm Noyes' statement regarding the age of onset of neuroses; however, it tends simultaneously to suggest an average duration of "most neuroses" somewhat less than might have been anticipated. These facts indicate the need for more reliable direct evidence than has hitherto been available regarding ages of onset and the duration of neuroses.

THE EVIDENCE ON THE PREVALENCE OF NEUROSES

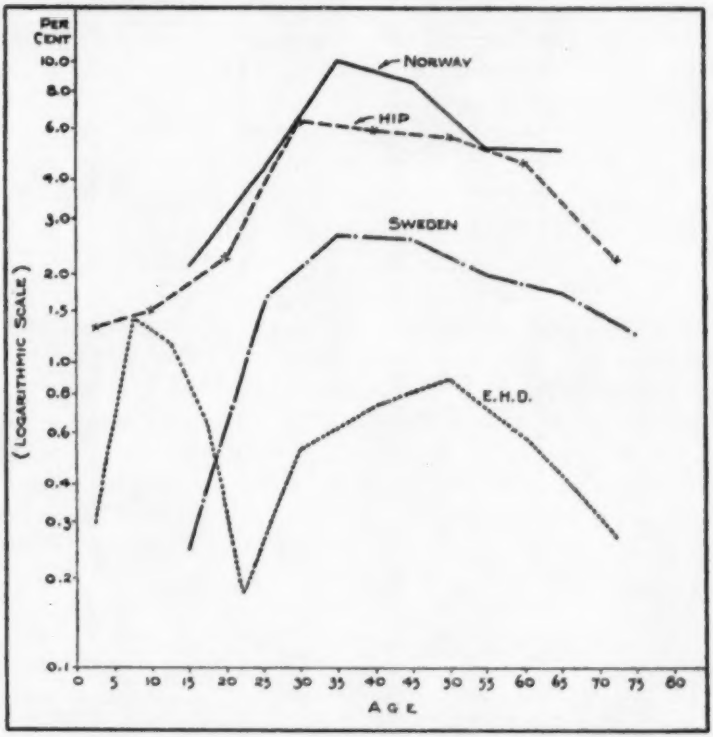
Figure 1 shows the curves which arise when the percentage of persons found to have neuroses in each age group is plotted. It may be seen that the various sources tend to confirm Noyes' picture of many neuroses having their beginning before the age of 35. The decline after the thirties is equally prominent.

An age-interval during which the prevalence of neuroses is rising must be one during which the number of new cases exceeds the number of cases terminating. Contrariwise, the later period of falling prevalence is one in which terminations exceed onsets. The period of rising prevalence lasts two to three dec-

[1] Institute of Psychiatry, The Maudsley Hospital, London.
[2] Milbank Memorial Fund.

ades. It is remarkable that so much variation in age of onset occurs in view of the fact that most currently held etiological theories relate to the period of early childhood. The long period of rising prevalence suggests that the onset of neuroses is an active phenomenon over many years of the life span. One would like to know the differences between neuroses beginning in the

Fig. 1. Evidence relating to age-specific prevalence.



NORWAY: Summation of psychoneurotic diagnoses arrived at by Bremer in his study of the whole population of a Norwegian fishing village where he served as the only physician during World War II (6).

SWEDEN: Neuroses diagnoses by personal interview of one of four psychiatrists surveying several rural parishes in Sweden (7).

EHD: Neurotic traits from service agency records in the Eastern Health District, Baltimore (8).

HIP: Average annual prevalence, 1948–1951, of psychoneuroses for which enrollees in the Health Insurance Plan of Greater New York received one or more services in any one year from a group of physicians. Psychiatric diagnoses included: psychoneurosis, 88 per cent; psychoses, 2.1 per cent; behavior disorders and intellectual difficulties, 10.3 per cent (mostly under 15 years) (9).

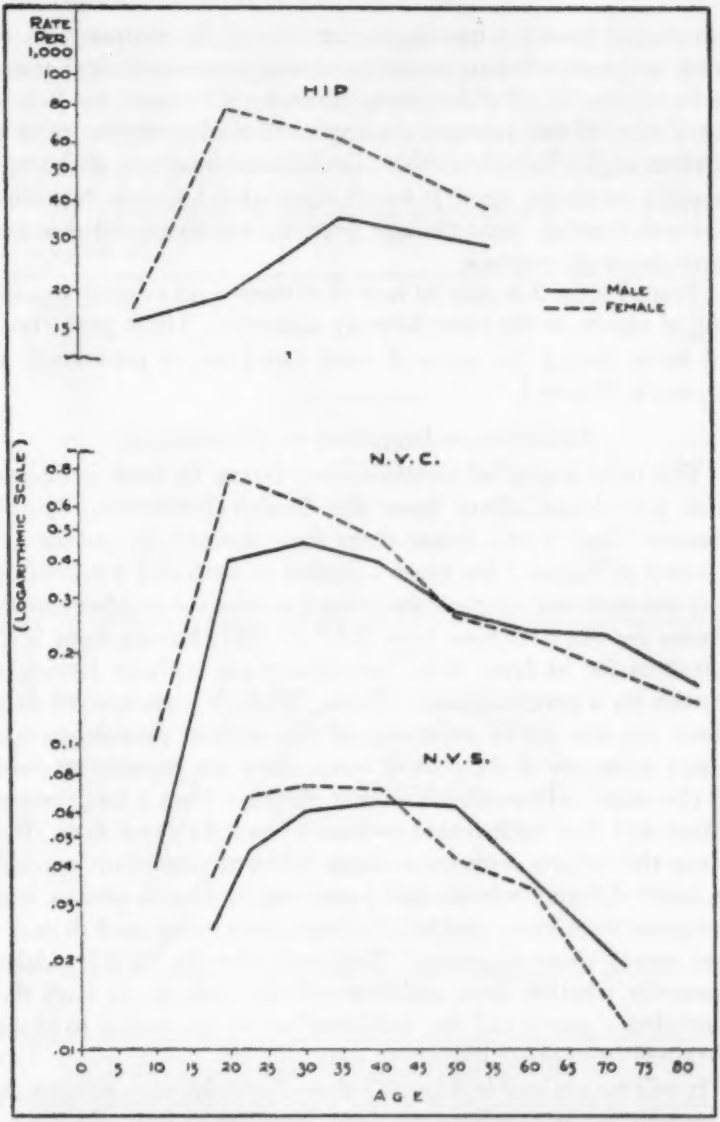
early twenties and those beginning in the middle thirties. Do they differ in clinical characteristics? Do they have different durations? (4, 5) Is there a difference in the circumstances surrounding the beginning of symptom formation?

The period of falling prevalence is one in which terminations of neuroses are more common than onsets. It may be that the neuroses commonly end during this period. They may come to an end because of recovery or because of the patient's death. If the clinical neuroses tend to be early phases of other illnesses, the neuroses may end by being transformed into a later phase, perhaps a somatization or a psychosis. In the second place, the terminations may be reflections of reduced severity: the neuroses may become less severe during this later portion of the life span and therefore be harder to recognize. In the third place, neurotic symptoms may, after a period of years, be less distressing to the individual as he becomes adapted to them and he may therefore complain less. Those who live with him may also become adapted to neurotic symptoms and find them less cause for complaint. This may account for the declining reported prevalence. In the fourth place, it may be that physicians are less responsive to neurotic complaints when they occur in older persons, or are more inclined to attribute them to some minor physical ailment and so not identify them as neurotic. Any, or a combination of all these four manners of terminating reported neurotic illnesses may be responsible for the decline in prevalence rates shown in Figure 1.

Evidence on the Incidence of Neuroses at Different Ages

With one exception, evidence relating to the incidence of neuroses and data relating to the prevalence of neuroses are available from different kinds of sources. In Figure 2 the age-specific incidence curves for neuroses are plotted as derived from a variety of clinical service agencies. There is reason to believe that these rates reflect a smaller proportion of neuroses than do the prevalence curves shown in Figure 1, and there is

Fig. 2. Evidence relating to age-specific incidence.



HIP: 'New Cases.' Enrollees receiving a service for psychoneurosis for the first time in 1951, having been enrollees for three previous years without receiving a service for psychoneurosis (9).

N.Y.C.: Annual rate of white persons discharged from New York City municipal hospitals with diagnosis of psychoneurosis. (Predominantly Bellevue and Kings County Psychiatric Divisions) (10).

N.Y.S.: Annual rate of first admission to State hospitals, New York State, with diagnosis of psychoneurosis (11).

no way of knowing how representative of the neuroses occurring in the populations served those who came to clinical attention might be. Furthermore, there is no reason to believe that most of the neuroses coming to clinical attention were of recent origin. In spite of these limitations the shape of the age-specific incidence curve is worth examining for clues regarding the relationship between age patterns for the incidence and prevalence of neuroses.

From Figure 2 it may be seen that these data suggest a peaking of onsets in the years of early maturity. These peaks tend to occur during the years of most rapid rise in prevalence as shown in Figure 1.

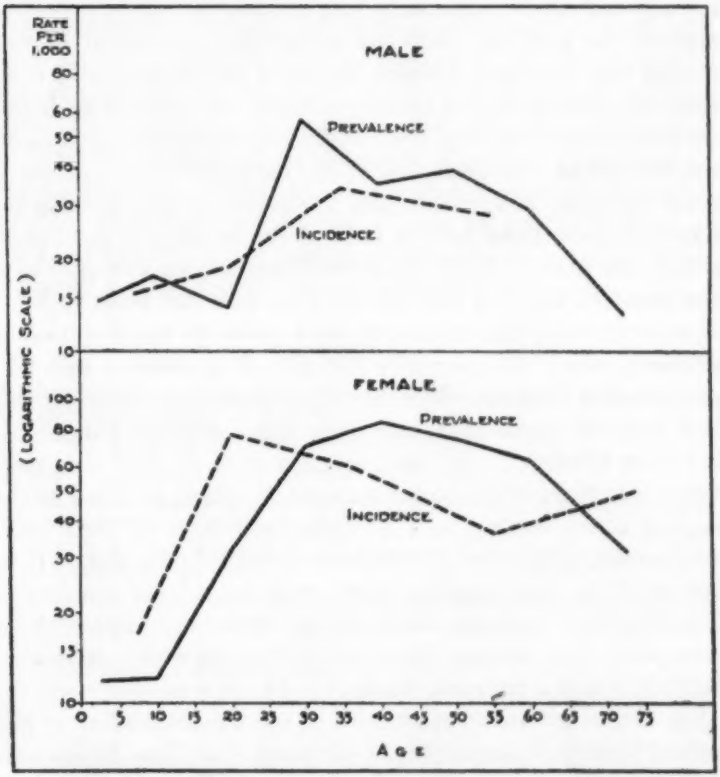
Relation of Incidence to Prevalence

The only source of information relating to both incidence and prevalence comes from the Health Insurance Plan of Greater New York. From these data age-specific curves are plotted in Figure 3 for cases reported as receiving a service in any one year and for cases receiving a service for psychoneurotic illness *for the first time* from HIP in 1951, having been HIP enrollees for at least three previous years without having a service for a psychoneurotic illness. While it is recognized that these are not direct estimates of momentary prevalence nor direct measures of the date of onset, they are superior to most of the other data available in that they are from a large population and that both measures derive from the same data. Because the reports stem from many different physicians trained in many different schools and practicing in diverse groups it is not possible to know just what criteria were being used to make and record these diagnoses. They undoubtedly varied widely. However, whether from accident or from consistency, both the 'prevalence' curve and the 'incidence' curve are similar to those obtained from other sources of data.

It will be noticed in Figure 3 that the incidence and prevalence curves not only have the same shape but are very close to one another, running almost parallel. From this it may be concluded that the variations in prevalence are due, predominantly,

to variations in incidence, since apparently the average duration of the neuroses reported in this population does not vary greatly with age. (The prevalence of an illness in a population is equal to the product of its incidence and duration.) Since the prevalence curve here is only slightly higher than the inci-

Fig. 3. For enrollees in HIP, average annual prevalence in 1948–1951 and incidence of "new cases" in 1951 of psychoneuroses for which services were given (9).



(See footnotes to Figs. 1 and 2.)

The prevalence curves reflect the average annual experience over the years 1948–1951 of all H.I.P. enrollees with 12 months of coverage in any one of those calendar years. There was a total of 60,302 person-years of exposure over this period; 2,714 of these person-years were characterized by the existence of one or more services related to mental illness.

The new case curves show the experience in 1951 of 6,643 enrollees who had entered H.I.P. by January 15, 1948, were still in the Plan on December 31, 1951, and had not received service related to psychoneurosis in 1948, 1949, or 1950.

dence curve, it follows that the average duration of these illnesses is between one and two years.

If the neuroses recorded in Figure 1 also have the same average duration at all ages, it would follow that their incidence rates would vary with age very much as do the prevalence rates.

Discussion

While it is well known that neurotic illnesses can occur at any age and exhibit extremely long courses as well as very brief courses, the available data are remarkably consistent in suggesting that neurotic illnesses are most characteristic of early adult life, that there is a rising incidence and prevalence during the twenties and thirties, a parallel rising prevalence continuing into the forties, and then a rapid decline in prevalence of recognized neuroses. From these data it is perfectly clear that, in the mass, neuroses must have a limited course even if untreated; in fact, the best available data would suggest an average duration between one and two years. This does not seem to be in consonance with the commonly held views on the duration of neuroses, which are generally thought of as tedious and self-perpetuating illnesses. Whether the discrepancy between this view and the apparently relatively short average duration is due to an artefact in the reported data or to the fact that neuroses of short duration do not impress clinicians as much as the nagging cases, leading to a misapprehension as to their common course, cannot be determined without better data. If in fact, as these data suggest, there must be a large number of short-duration neuroses, it would be extremely important to know more than we now do about the factors which determine the duration of a neurotic illness. (3, 4).

For future studies to contribute to our understanding of the natural history of neuroses it is necessary that they distinguish levels of severity as well as clinical types. Data unrelated to levels of severity are of extremely limited use. Levels of severity of neurotic illnesses may be expected to vary with respect to (a) the patient's conscious sense of distress, (b) the awareness of the persons with whom he lives and of his attending

physician that something is wrong, (c) the extent of disability and the type of disability produced by the neurotic illness, and (d) the ease with which symptoms can be identified as neurotic symptoms. It is also important that the reporting of cases of neuroses should not be dependent upon the previous duration of the case nor upon assumed prognosis. Only data meeting these criteria can be expected to help us understand these pervasive and distressing illnesses.

An association of a disorder, or group of disorders, with particular phases of the life span as marked as that suggested in the data presented in this paper, suggests that attention to the special characteristics of this age group might yield information regarding the etiology of the disorders. Obviously, the years of early adult life have their own particular psychological, social, and physical characteristics and it is to be presumed that at least some of them are of etiological importance in determining the special predilection of this age group for neuroses.

References

1. Cameron, N.: Neuroses of Later Maturity *in* Mental Disease in Later Life. Ed.: Kaplan, O. J.; Stanford U. P., 1947.

2. Kanner, L.: Child Psychiatry. Blackwell, 1948.

3. Noyes, A.: Modern Clinical Psychiatry. Saunders, 1953.

4. Eitinger, L.: Studies in Neuroses. *Acta Psychiatrica et Neurologica Scandinavica,* Supplement 101. Copenhagen, 1955.

5. Brill, N. Q., and Beebe, G. W.: A Follow-Up Study of War Neuroses. VA Medical Monograph, 1955.

6. Bremer, J.: A Social Psychiatric Investigation of a Small Community in Northern Norway. *Acta Psychiatrica et Neurologica Scandinavica,* Supplement 62. Copenhagen, 1951.

7. Essen-Möller, E.: Individual Traits and Morbidity in a Swedish Rural Population. *Acta Psychiatrica et Neurologica Scandinavica.* Supplement 100. Copenhagen, 1956.

8. Lemkau, P.; Tietze, C.; and Cooper, M.: Complaint of Nervousness and the Psychoneuroses. *American Journal of Orthopsychiatry,* 1942, XII, No. 2, 214.

9. Densen, Paul: Morbidity in a Medical Care Plan. (In preparation)

10. Fraenkel, Marta, and Erhardt, Carl L.: Morbidity in the Municipal Hospitals of the City of New York. New York, Russell Sage Foundation, 1955.

11. Department of Mental Hygiene, State of New York: Sixty-Third Annual Report of the Year Ending March 31, 1951. Albany, 1952.

THE DIFFERENTIAL FERTILITY OF THE NEGRO POPULATION, HOUSTON, TEXAS, 1940–1950

JACK E. DODSON[1]

RESEARCH on differential fertility has provided knowledge of current trends in the United States remarkably well in recent years. Less effort has been directed, however, at racial and ethnic group differentials than at socio-economic differentials. The purpose of this paper is to add to knowledge of recent trends of the differential fertility of urban Negro populations. Data for Houston, Texas, are used for comparisons of changes in the patterns of Negro and total white (or Anglo and Latin-white) fertility from 1940 to 1950. The comparisons of the trends of change in Negro fertility involve: (1) analysis of birth rates by age and birth order for the total white and Negro[2] women 15–44 years of age during 1940 and 1950; (2) analysis of birth rates by age and birth order for the white and Negro *married* women 15–44 years of age during 1940 and 1950; (3) analysis of birth rates by age for the Anglo-white,[3] the Latin-white,[4] and the Negro women for 1940 and 1950; (4) analysis of birth and birth order rates by age for socio-economic groups of the Negro and Anglo-white populations for 1940 and 1950.

Prior to the main discussion, certain limitations of the research must be noted. One potentially serious limitation is that the data are for the Central City of Houston. Data were not available for the Houston Standard Metropolitan Area.

[1] Texas College of Arts and Industries. Materials for this paper were taken from the writer's "Differential Fertility in Houston, Texas, 1940–1950: A Study of Recent Trends" (Unpublished Ph.D. dissertation, University of Texas, 1955).

[2] Although the data used in the computation of rates are for nonwhites, the term Negro is used because in Houston in both 1940 and 1950 the nonwhite population was almost exclusively Negro. In both 1940 and 1950 Negroes comprised over 99 per cent of the nonwhite population of the City.

[3] The Anglo-white population includes all white persons who do not have Spanish surnames.

[4] The Latin-white population includes all white persons who have Spanish surnames.

This limitation is mitigated somewhat by a fortunate circumstance. In December, 1949, an extensive annexation occurred which brought most of the Urbanized Area of the Houston Standard Metropolitan Area within the corporate limits of Houston. Data for 1950, therefore, include most of the fertility records of urban Houston. In 1940 Houston did not have an unusually extensive fringe development.

The data from which fertility rates were computed for 1940 were less satisfactory than the data used in computing rates for 1950. Rates for 1940 were computed from a 33.3 per cent sample of births for the year. Rates for 1950 were computed from the three-year averages of all births for 1949, 1950, and 1951.[5] All births used in the computation of rates were by place of occurrence; however, births to non-residents were excluded in all instances. It is unlikely that births to residents of Houston which occurred outside the City constituted an important fraction of the total births to residents.

Differentials In Age-Specific and Birth Order Rates

The age-standardized birth rate (number of births per 1,000 women 15–44 years per year) for the Negro population of Houston increased more rapidly and became greater than the same type of rate for the total white population from 1940 to 1950 (Table 1). There were marked changes in the pattern of differentials in age rates during the decade. In 1940 the chief differences between the age patterns of white and Negro fertility were the greater concentration of Negro births in the younger age groups and the correspondingly greater concentration of white births in the older age groups. In 1950 the chief differences were a greater concentration of Negro births in the older age groups and a correspondingly greater concentration of white births in the younger ages. The fertility rate of Negro women of the youngest age group was still greater

[5] Special acknowledgement is due Mr. W. H. Alban, Director of the Bureau of Vital Statistics, Houston Department of Health, for the cooperation given to the writer and for the excellent birth records which are maintained by the City of Houston.

Table 1. Births per 1,000 women by color, age, and birth order, Houston, Texas, 1940 and 1950.[1]

Age and Year	Age Rate		Birth Order													
			1		2		3		4		5		6		7 and Higher	
	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
15–19																
1940	72.6	122.8	55.6	82.4	14.0	30.8	3.0	6.8		2.8						
1950	101.0	143.0	76.4	83.6	21.4	41.6	2.4	14.2	.8	3.6						
20–24																
1940	131.0	123.4	72.4	42.2	40.8	41.2	15.0	25.2	2.8	10.8		2.0		2.0		
1950	183.2	162.8	82.4	42.4	64.2	51.8	25.2	38.0	7.8	18.6	2.4	8.4	.8	3.2	.4	.4
25–29																
1940	99.8	65.0	37.2	11.6	32.4	10.8	14.8	14.8	7.2	6.4	2.6	8.6	2.4	6.4	3.2	6.4
1950	138.6	133.4	34.0	24.8	48.4	33.8	30.6	23.2	13.4	20.8	6.4	14.0	3.4	7.0	2.4	9.8
30–34																
1940	59.2	30.8	14.2	2.0	16.4	7.0	8.0	5.8	6.6	3.2	4.0	3.2	3.6	3.8	6.4	5.8
1950	77.4	83.4	12.8	9.6	22.8	15.4	19.4	14.4	10.8	11.8	5.6	8.8	2.8	8.6	3.2	14.8
35–39																
1940	31.8	16.2	4.8	2.0	5.6	1.8	3.4	1.4	2.4	4.0	4.4	.8	2.4	1.4	8.8	4.8
1950	32.4	59.0	4.8	7.2	7.4	8.0	8.2	9.6	4.8	9.4	2.8	6.4	1.6	6.8	2.8	11.6
40–44																
1940	8.8	5.2	.4		1.6				.4	1.0	.4	1.0	1.2		4.8	3.2
1950	8.6	14.6	1.2	1.2	1.6	.8	1.2	1.4	.8	1.4	.8	1.8	.8	2.4	2.2	5.6
Age-standardized Birth Rate[2]																
1940	70.8	60.8														
1950	95.4	102.2														

[1] The rates for whites are corrected for an estimated 4 per cent under-registration of births in 1940 and 2 per cent in 1950. The rates for Negroes are corrected for an estimated 15 per cent under-registration of births in 1940 and 3 per cent in 1950.

[2] The standard was the age distribution of all women 15 to 44 years old in Houston in 1950. Computed from United States Bureau of the Census, United States Census of Population: 1950, Vol. II, Characteristics of the Population, Part 43, Texas, Table 57.

than the rate for white women of the same age group in 1950, but the difference in rates for this age group was less than in 1940. The fertility of white women was greater for only the two age groups in the 20–29 year span in 1950. During the decade Negro fertility rates increased proportionately more for the age groups above 25 years than for younger women. In contrast, white fertility rates increased more for the age groups under 25 years.[6]

The different trends of change in fertility rates for age groups of Negro and white women were associated with different trends of change in birth order rates by age. From 1940 to 1950, increases in third, fourth, and fifth order births were pronounced for Negro women of the age groups in the 20–39 span. Increases in sixth and seventh and higher order births were notable for the age groups in the 20–44 span. Second and third order births increased for the age group 15–19 years. In comparison, white women of the age groups in the 20–34 span experienced the greatest increases for second through fourth order births, with smaller increases for fifth order births, and generally declines for sixth and seventh and higher order births. White women in the two age groups in the 35–44 span experienced declines in fifth and higher order births and either small increases or little change in lower order births during the decade.

Marital rates, which are more refined because unaffected by the proportion married in each age class, in general show the same trends for age rates from 1940 to 1950 for Negro and white women that were indicated by the general age rates (Table 2). It should be noted, however, that marital fertility decreased sharply for Negro and slightly for white women in the 15–19 age group during the decade. The increase in the general rates for both Negro and white females of this age group shown in Table 1 was, therefore, the result of greater proportions married in this age group in 1950.

[6] There were not similar changes in Negro and white differentials in age rates in Detroit from 1940 to 1950. Although Negro total fertility increased more and came

(Continued on page 271)

Table 2. Births per 1,000 married women by color, age, and birth order, Houston, Texas, 1940 and 1950.[1]

Age and Year	Age Rate		Birth Order Rates													
			1		2		3		4		5		6		7 and Higher	
	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro	White	Negro
15–19																
1940	390.8	627.8	295.8	424.4	75.8	153.8	16.6	34.8	2.4	14.8	.2					
1950	376.2	504.8	284.0	294.8	79.8	147.4	8.8	50.4	3.6	12.2						
20–24																
1940	223.6	207.6	123.6	72.2	69.8	71.6	25.2	42.2	4.8	18.2	.2	3.4				
1950	256.6	224.0	117.0	59.4	89.8	71.0	35.2	52.0	10.8	25.6	3.6	11.6	.2	4.4		
25–29																
1940	130.6	91.4	49.2	15.2	42.0	15.6	19.4	21.6	9.4	9.2	3.2	12.0	3.2	8.8	4.0	8.8
1950	163.0	158.2	40.0	31.4	57.0	41.2	36.0	27.2	15.6	24.4	7.6	16.4	4.0	8.4	2.8	11.6
30–34																
1940	75.0	44.2	18.0	5.2	18.8	9.0	10.2	8.0	8.2	4.4	5.2	4.4	4.6	5.2	10.0	8.0
1950	90.4	100.6	15.2	12.0	26.6	18.6	22.8	17.4	12.4	14.2	6.6	10.4	3.2	10.4	3.6	17.6
35–39																
1940	40.0	23.6	6.2	3.0	7.2	2.8	4.4	2.2	2.8	6.0	5.4	.8	3.2	2.0	10.8	6.8
1950	38.8	69.4	5.6	8.6	8.8	9.6	9.6	11.2	6.0	11.0	3.4	7.4	1.8	8.0	3.6	13.6
40–44																
1940	11.6	8.0	.4		2.2				.8	1.6	.6	1.6	1.6		6.0	4.8
1950	10.2	19.2	1.4	1.6	2.0	.8	1.6	2.0	1.0	2.0	.8	2.4	1.0	3.2	2.4	7.2
Age-standardized Martial Birth Rate[2]																
1940	113.2	102.8														
1950	128.6	136.8														

[1] All rates corrected for under-registation of births. (*See* note, Table 1).
[2] Standardized by age distribution of all ever-married women 15–44 in Houston, 1950.

Changes in marital birth order rates by age groups for Negro and white women from 1940 to 1950 were similar to the changes indicated by the general birth order rates with only minor exceptions. Marital birth order rates for Negro women increased for second and all higher order births for all age groups in the 20–39 span. For age groups in the 20–29 span increases were greatest generally for second, third, fourth, and fifth order births. For the age group in the 30–39 span increases were marked for sixth and seventh and higher order births as well as lower order births. Marital birth order rates for white women in age groups in the 20–34 span increased for second, third, fourth, and fifth order births (with somewhat less increase for fifth order births) and either changed little or decreased for sixth and seventh and higher order births. Marital birth order rates for white women over 35 decreased for sixth and seventh and higher order births and changed little for lower order births.

The comparison of general and marital rates by age for Negro and white women shows that the increases in fertility for both groups from 1940 to 1950 were largely the result of increases in the proportion married. However, increases in marital fertility were responsible for part of the increase in the birth rate of both groups. For the Negro women the increase in the birth rate from 1940 to 1950 was largely the result of larger proportions married in the younger ages together with increases in marital fertility in the middle and older age groups. For the white women the increase in the birth rate was largely the result of larger proportions married in the 15–19 and 20–24 age groups together with increases in marital fertility for ages 20–34. For ages over 35 years, white marital fertility declined slightly. The greater over-all increase in Negro birth rate from 1940 to 1950 in comparison with the increase in white birth rate was the result of greater increases in the proportion of Ne-

to exceed white total fertility from 1940 to 1950 for Detroit, Negro fertility continued to exceed white fertility only in ages 15–24 in 1950. *See* Mayer, Albert and Klaprodt, Carol: Fertility Differentials in Detroit: 1920–1950. *Population Studies*, November, 1955, IX, No. 2, pp. 148–158.

gro women married rather than greater increases in marital fertility.

The age-standardized birth rate for the Latin-white population[7] of Houston was greater than the age-standardization birth rate for the Negro population of Houston in both 1940 and 1950. During the decade, however, the differential was reduced. Trends of change in the age patterns of fertility of the two ethnic groups were different (Table 3). Although age rates for Latin-white women were greater for every age group for 1940 and 1950, the trends were toward narrowing the differentials for each age group except those in the 20–29 span.

Table 3. General fertility rates by age for the Negro, Latin-white and Anglo-white populations of Houston, Texas, 1940 and 1950.[1]

Age Group and Year	Age Rates		
	Negro	Latin-White	Anglo-White
15–19			
1940	122.8	195.0	57.6
1950	143.0	143.8	92.2
20–24			
1940	123.4	210.0	123.6
1950	162.8	305.2	152.0
25–29			
1940	65.0	196.0	91.4
1950	133.4	258.4	118.8
30–34			
1940	30.8	199.2	53.6
1950	83.4	170.8	70.2
35–39			
1940	16.2	136.2	27.0
1950	59.0	84.8	27.2
40–44			
1940	5.2	47.0	7.6
1950	14.6	36.0	8.2
Age-standardized Birth Rate[2]			
1940	60.8	167.8	64.0
1950	102.2	176.8	82.2

[1] Rates corrected for under-registration of births. (*See* note, Table 1).
[2] Standardized by age distribution of all women 15–44 in Houston, 1950.

[7] In computing rates it was necessary to estimate the number of Latin-white women 15–44 years for Houston for 1940 because of lack of census data. The estimate was based upon data contained in a survey of housing in Houston in 1939 in which dwellings were classified by ethnic group identity of inhabitants and by number of occupants.

Age-specific rates decreased for the youngest and oldest age groups for the Latin-whites as opposed to increases in Negro rates for all ages. The fertility of Latin-white women became more concentrated in ages 20–29 while the fertility of Negro women became more evenly distributed through all ages.

The rates given in Table 3 are not standardized for marriage. Marital rates could not be computed for Latin-white women. It is not possible, therefore, to ascertain the effects of changes in proportions married for the age-specific rates of the Latin-white population. It appears likely, however, in light of the decrease in rates for ages 15–19 and the large increase in rates for ages 20–29 that there was a trend toward later marriage for Latin-white females during the decade. This trend would contrast with the trend toward marriage at younger ages for both Negro and Anglo-white women.

Comparisons of Negro and Anglo-white age-specific rates for 1940 and 1950 reveal similar differences as did the comparison of Negro age rates with the age rates for the total white population (*see* Table 3). The rates for the Anglo-white population were greater for all ages above 25 years in 1940. In 1950 Negro rates were greater for all ages. There were less differences in rates in 1950 for age groups in the 20–35 span. Anglo-white rates increased proportionately more for women in the 15–35 age span while Negro rates increased more for women in the 25–44 age span. Birth order rates for Negroes increased most for fourth and fifth order births with notable increases also for higher order births. In comparison birth order rates for Anglo-whites increased for third, fourth, and fifth order births and decreased for sixth and higher order births.

Trends of Socio-Economic Differentials

The trends of change in socio-economic differentials for the Negro and white populations, as indicated by general fertility rates by age and by order of birth, were dissimilar between 1940 and 1950 (Tables 4 and 5). Although, in general, fertility

is indicated to have been inversely related with socio-economic rank for both Negroes and whites for 1940 and 1950, some

Table 4. Births per 1,000 Negro women by age and socio-economic rank, and number of births of given order expressed as percentages of all births to women of given age and socio-economic rank, Houston, Texas, 1940 and 1950.[1]

Age and Birth Order Classes	Socio-Economic Rank					
	I (High)		II		III (Low)	
	1940	1950	1940	1950	1940	1950
15–19	98.2	160.6	85.8	160.8	94.2	168.4
1 and 2	91	89	87	86	100	83
3 and 4	9	11	13	13		17
5 and 6				1		
20–24	98.8	173.4	112.2	179.2	126.8	200.6
1 and 2	80	58	57	57	80	52
3 and 4	17	33	43	35	15	39
5 and 6	3	8		8	5	9
7 and Higher		1				
25–29	61.0	116.0	59.0	115.0	68.8	150.6
1 and 2	48	34	28	32	37	32
3 and 4	29	38	36	34	20	33
5 and 6	16	21	26	22	37	22
7 and Higher	7	7	10	12	6	13
30–34	20.2	68.4	38.2	71.6	32.2	101.4
1 and 2	43	26	15	22	50	18
3 and 4	21	33	38	19		32
5 and 6	7	25	11	23		27
7 and Higher	29	16	36	26	50	23
35–39	12.0	28.2	15.8	32.4	22.0	61.8
1 and 2	37	24	33	16		19
3 and 4	37	24	42	26		16
5 and 6		23	9	26	50	28
7 and Higher	26	29	16	32	50	37
40–44		8.6	7.6	6.8		18.2
1 and 2		11		15		11
3 and 4		22		14		
5 and 6		22		29		
7 and Higher		45	100	42		89
Age-standardized Birth Rate[2]	49.0	94.4	54.4	96.2	59.0	120.0

[1] Rates are not corrected for an estimated 15 per cent under-registration of births in 1940 and 3 per cent in 1950. Approximately 9 per cent of the Negro population in 1940 and 10 per cent in 1950 were not included in any of the three socio-economic groups because they did not reside in predominantly nonwhite areas of Houston.

[2] Standardized by age distribution of all women 15–44 in Houston, 1950.

notable differences in the over-all pattern of socio-economic differentials are disclosed.

Table 5. Births per 1,000 Anglo-white women by age and socio-economic rank, and number of births of given order expressed as percentages of all births to women of given age and socio-economic rank, Houston, Texas, 1940 and 1950.[1]

Age and Birth Order Classes	Socio-Economic Rank									
	I (High)		II		III		IV		V (Low)	
	1940	1950	1940	1950	1940	1950	1940	1950	1940	1950
15–19	15.6	38.2	41.4	81.2	64.6	109.6	66.2	117.0	92.2	135.8
1 and 2	100	96	96	98	85	97	93	95	94	96
3 and 4		3	4	2	15	3	6	5	6	4
5 and 6		1					1			
7 and Higher										
20–2	80.0	148.2	119.8	157.0	108.8	177.0	124.0	197.0	149.2	219.2
1 and 2	96	88	95	88	89	81	85	78	79	77
3 and 4	3	11	5	12	11	19	13	20	19	21
5 and 6	1	1					2	2	2	1
7 and Higher										1
25–29	93.8	144.2	69.6	126.4	70.0	120.0	100.2	133.6	98.8	140.8
1 and 2	93	71	80	70	77	56	55	56	59	48
3 and 4	6	25	15	27	21	36	33	36	30	39
5 and 6	1	3	2	3		6	8	8	10	11
7 and Higher		1	3		2	2	4		1	2
30–34	52.8	83.4	48.2	74.6	46.6	69.8	48.4	74.4	56.0	85.0
1 and 2	73	54	72	56	63	44	41	43	21	34
3 and 4	23	40	25	38	26	41	24	38	14	41
5 and 6	1	5	3	6	9	12	19	14	23	19
7 and Higher	3	1			2	3	16	3 5	42	6
35–39	18.6	34.0	13.6	32.2	21.6	28.4	30.8	2.4	46.4	33.6
1 and 2	46	43	70	43	57	36	30	35	18	35
3 and 4	42	44	20	40	9	43	21	42	14	37
5 and 6	4	9	10	14	30	15	20	16	24	18
7 and Higher	8	4		3	4	6	29	7	44	10
40–44	2.8	8.0	5.0	6.4	6.0	6.8	13.6	9.4	11.2	8.4
1 and 2	100	47	34	46		38		28	5	26
3 and 4		33	35	31	21	22		26	7	16
5 and 6		14	31	12	22	12	34	25	23	34
7 and Higher		6		11	57	28	66	21	65	24
Age-standardized Birth Rate[2]	48.6	83.2	53.2	84.6	55.4	89.4	67.6	98.6	78.8	108.6

[1] Rates are not corrected for an estimated 4 per cent under-registration of births in 1940 and 2 per cent in 1950.
[2] Standardized by age distribution of all women 15–44 in Houston, 1950.

There was no indication of diminution of socio-economic differentials in the fertility of the Negro population from 1940 to 1950. During the decade, Negro fertility increased markedly but the increase was largely proportional among the three socio-economic groups.[8] There were some changes in the relative differentials between age groups of the three socio-economic classes. In 1940 the fertility of the middle-rank group was greater than the fertility of the top-rank group mainly because of higher rates for the age groups above 30 years. The greater fertility of the lowest rank group in 1940 was mainly the result of the greater fertility of the ages 20–29 years. In 1950 the greater fertility of the middle rank group over the top rank group was still the result of higher fertility in the age groups over 30 years but the fertility of the lowest rank group had become greater for all ages. It is to be noted that the rates increased for all ages of all three rank groups, but the increases in rates for the older ages were greatest for the lowest rank group.

The proportion of third and fourth, and fifth and sixth order births increased for the ages 20–29 years for all three rank groups. The proportion of third and fourth, and fifth and sixth order births also increased for the ages 20–29 for all three rank groups. The proportion of third and fourth, and fifth and sixth order births also increased for ages 30–34 for all rank groups together with some decrease in the proportion of births higher than sixth order. There was no major change in the proportionate composition of the age rates for women above 35 years.

In contrast to the maintenance of socio-economic differentials in Negro fertility, Anglo-white socio-economic differ-

[8] An index based on educational attainment, condition of housing, and rent (1940) or income (1950) was used to establish three socio-economic groups for the Negro population. The index weighted equally the percentile scores for each census tract which were computed from each tract's proportion of persons 25 years and under with only grade school education or less, proportion of dwelling units which were without running water or dilapidated, and either average rent per capita (1940) or median income of families and unrelated individuals (1950). This index was substituted for the Shevky-Williams index because it was believed that the occupational component of the Shevky-Williams index made it unreliable for the Negro population.

entials were indicated to have diminished between 1940 and 1950. Fertility remained, in general, inversely related with socio-economic rank for the Anglo-white population in 1950, but the rate of increase for the top rank group exceeded the rate of increase of the lower rank groups from 1940 to 1950. The trend toward elimination of socio-economic differentials within Anglo-white fertility was the result of changes in differentials between several age groups of the five socio-economic groups.[9]

In 1940 the higher fertility of the lower rank groups was mainly the result of higher fertility in the ages 15–24 and higher fertility in ages 35–44 without there being great difference in the fertility of the middle-age group (25–34). In 1950 fertility remained in general in inverse relation with socio-economic rank because of the continued greater fertility of the lower rank groups for ages 15–24. The socio-economic differentials were reduced because of the greater gains in the fertility of ages 25–44 for the higher rank groups together with slight decreases in the rates for the older age groups for the lowest rank group. It is notable that there was a reversal of the inverse relation between fertility and socio-economic rank for the ages 25–39 and only a partial inverse relationship for the oldest age group. The continuation of the over-all inverse relationship was solely the result of the greater fertility of the lower rank groups for ages 15–25.

The proportion of third and fourth order births increased for the ages 20–24 for all five socio-economic rank groups. Rank groups I, II, and III, the higher rank groups, showed increases in the proportions of third and fourth order births for ages 20–34. Rank groups IV and V showed decreases in the proportions of fifth and higher order births for the age groups over 25 years.

[9] The Anglo-white population of each of the City's census tracts was given a social rank score using the Shevky-Williams index of social rank. Five socio-economic groups were established by combining the populations of census tracts with approximately the same social rank scores. For 1950 the index was modified in that median income for families and unrelated individuals was substituted for the rent component of the index.

It would be desirable to have marital rates to compare with the rates by socio-economic rank group given in Tables 4 and 5. Undoubtedly differences in the proportion of women married among the socio-economic groups account for part of the differences in rates indicated. If the plausible assumption is made that the proportion of women married in ages 15–24 is greater for the lower socio-economic rank groups and that proportions married differ most for the younger ages, marital rates would indicate greater differences in the patterns of Negro and Anglo-white socio-economic fertility differentials. For 1950, with one exception, Negro age rates were inversely related with socio-economic rank for the ages above 25 years. For 1950 Anglo-white age rates were generally directly related with socio-economic rank for ages above 25 years.

Conclusions

The idea that Negro fertility is tending to approximate more closely the pattern of fertility of the white population has appeared tentatively acceptable in recent years. There exists some evidence that color differentials have diminished for urban populations in recent years.[10] The trend of the pattern of Negro fertility for Houston from 1940 to 1950, however, does not wholly support the hypothesis of converging fertility patterns between color groups.

Although the sharp decline in Negro marital fertility for ages 15–19 between 1940 and 1950 does represent a trend toward reduction of differentials, changes in the fertility rates of other age groups of Negro women tended to increase differentials. While white fertility became more concentrated in ages 20–34 from 1940 to 1950, Negro fertility became more evenly distributed through all ages because of increases in the rates for women over 30 years.

Socio-economic differentials for the Negro population were more pronounced in 1950 than for the Anglo-white population.

[10] *See* Westoff, Charles F.: Differential Fertility in the United States: 1900 to 1952, *American Sociological Review*, October, 1954, XIX, No. 5, pp. 550–554; Mayer and Klapprodt: *op. cit.*, pp. 151–153.

Negro socio-economic differentials were maintained from 1940 to 1950 while Anglo-white socio-economic differentials were diminished.

The increases in marital rates for fifth and higher order births for Negro women 20 years and older appears to indicate at least a temporary trend toward larger size of family. In contrast, the decrease in marital rates for sixth and higher order births for white women over 25 years together with the increases in marital rates for fourth and fifth order births for white women in the ages 20–34 appears to indicate offsetting trends toward increase and decrease in average size of family.

MEDIAN AGE AT FIRST MARRIAGE IN SWEDEN, 1881–1953

ROLLIN CHAMBLISS[1]

THE published vital statistics of most countries, including the United States, are not adequate for the study of changes that may have taken place in the median age at first marriage over a considerable period of time. Sweden, along with the other Scandinavian countries and Finland, affords a rare example of accurate marriage records long maintained. From published official records, it is possible to compute the median age at first marriage in Sweden from 1881 to 1953. This paper presents the results of that computation.[2]

Official vital statistics in Sweden date from a law enacted in 1748 requiring the clergy to make tabular compilations from the church registers. Baptismal, wedding, and death registers had long been kept by parish priests, and the Statistical Commission created in 1756 was able to utilize not only the services but also the experience of the clergy in standardizing and improving the preparation and maintenance of birth, death, marriage, and divorce records. This was probably the world's first national bureau of vital statistics.

Since 1881, official statistics have been published in Sweden that not only give for the entire country the ages at which males and females marry but also distinguish between first marriages and remarriages. Where this distinction is not made, the remarriage of the widowed and divorced introduces a source of possible misinterpretation that may be of considerable importance.

For the period from 1881 to 1900, it is necessary to make computations from data recorded in five-year age groups. The median ages computed from grouped data in this period are based, therefore, on the assumption that there was an equal

[1] Professor of Sociology, University of Georgia.

[2] For comparable data on Finland see an article by the present writer entitled "Contributions of the Vital Statistics of Finland to the Study of Factors that Induce Marriage" in *American Sociological Review*, February, 1957, 22, pp. 38–48.

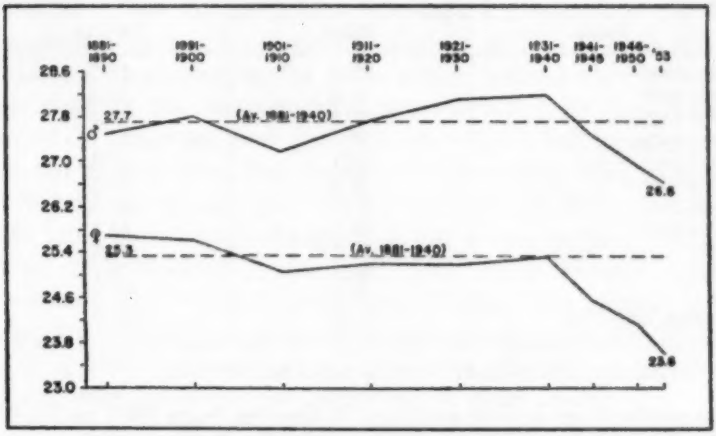


Fig. 1. Median age at first marriage in Sweden, 1881–1953.

distribution of marriages by year for the five-year period. Since 1901, the published tables have given first marriages by age in years. Consequently, the median ages computed from grouped data for the period 1881–1900 are not exactly comparable with those computed for ungrouped data for the period 1901–1953. It does not appear, however, that this minor change in method of computation, made necessary by the change in the form in which the official statistics are available, has an appreciable influence on the trend pattern described in this paper.

The Central Bureau of Statistics has published for the period 1861–1950 tables showing marriages by sex and age per 1,000 single persons, and for the same period computations of the *average*[3] age at first marriage for both sexes. These summary tables are presented in Appendix Tables 1 and 2. It was not until 1945, however, that the annual official publication of vital statistics began to include a computation of the median age at first marriage. As an expression of the central tendency in age at first marriage, the median has advantages that justify its computation where that is possible. Figure 1 and Table 1 show

[3] In Swedish statistics *average* represents an *arithmetic mean.*

Years	Male	Female
1881–1890	27.5	25.7
1891–1900	27.8	25.6
1901–1910	27.2	25.1
1911–1920	27.7	25.2
1921–1930	28.1	25.2
1931–1940	28.2	25.3
1941–1945	27.5	24.5
1946–1950	26.9	24.1
1951	26.7	23.8
1952	26.7	23.7
1953	26.6	23.6
Average 1881–1940	27.7	25.3

Table 1. Median age at first marriage in Sweden, 1881–1953.

the median age at first marriage in Sweden from 1881 to 1953.[4] These utilize ten-year periods to 1940 and two subsequent five-year periods. Medians for each single year during 1881–1953 are presented in Appendix Table 3.

Comments. In these data, the total number of males who married for the first time, excluding the year 1953 for which figures were not available, was 2,627,654 and of females was 2,743,149. Thus, there were 115,495 more females than males in the first marriages recorded in these data. Obviously, some persons marrying for the first time take husbands or wives who had contracted a prior marriage, but these figures show that in Sweden, as seems to be the case generally, a widowed or divorced man is more likely to marry a maiden than is a widowed or divorced woman to marry a bachelor. In every year, the number of females marrying for the first time was larger than the number of males marrying for the first time.

The male age at first marriage shows only slight fluctuations from 1881 to 1941. Then began a decline that lasted during the war years. By 1946 the median age at first marriage for males was 26.9 years. There has been little change since

[4] Since 1880, the age at marriage reported in the vital statistics of Sweden has represented age at *last* birthday. The median ages computed in this paper would, therefore, be more realistic if one half-year were added to the medians as shown. This has not been done because official Swedish publications containing for recent years computations of median ages at first marriage do not make this refinement.

that date, but the age at first marriage for males has not increased; in fact, it has decreased slightly to 26.6 years in 1953. This is the youngest age for males shown in these computations by year for the seventy-three years covered by this study. Swedish males are now entering marriage a full year earlier on the average than was the usual custom from 1881 to 1940. Although the change since 1940 is a relatively slight one, it is the most pronounced change that has occurred since 1881 at least. Furthermore, it has been consistently towards earlier marriage and reverses a trend from 1901 to 1940 towards later marriage. While it is yet much too early to evaluate the change, it may indicate that Sweden's deliberate efforts to make marriage more attractive are beginning to show results.

Changes in the median age at first marriage for females correspond very closely with those that have occurred among males, except for a greater decrease in the marriage-age of females. The difference of approximately three years between the ages of males and females at marriage that has existed since early in this century has been maintained. It is interesting to observe that the age difference was only about two years or even less during the first twenty-five or thirty years covered by this study.

In 1953, males in Sweden married for the first time at the median age of 26.6 years, which was about one year younger than was the average between 1881 and 1940, and females married for the first time at the median age of 23.6 years, which was 1.7 years younger than was the average between 1881 and 1940.

Appendix Table 1. First marriages per 1,000 single persons, by age.

Year	15–19 Years	20–24 Years	25–29 Years	30–34 Years	35–39 Years	40–44 Years	45–49 Years	50 — Years
Males								
1861–1870	0.1	42.3	104.4	106.2	72.1	48.9	26.4	6.3
1871–1880	0.1	45.3	113.2	120.2	85.1	51.0	28.9	7.5
1881–1890	0.2	45.4	104.5	101.7	71.0	43.3	25.3	6.4
1891–1900	0.2	44.5	101.3	92.6	65.9	41.8	23.7	6.0
1901–1910	0.3	42.5	100.2	88.9	60.7	37.4	21.7	5.3
1911–1920	0.3	37.1	101.5	91.5	60.7	38.1	22.4	5.7
1921–1930	0.2	33.0	95.3	94.4	62.9	37.4	20.9	5.2
1931–1940	0.4	40.7	110.8	107.7	70.2	41.0	22.1	5.3
1941–1950	2.8	70.6	145.0	113.9	68.8	39.6	23.0	5.7
Females								
1861–1870	8.4	65.8	98.1	83.1	53.4	29.6	14.5	2.1
1871–1880	8.8	70.4	104.6	83.8	53.0	30.5	15.5	2.9
1881–1890	9.1	66.6	95.9	71.4	43.6	24.8	14.2	2.2
1891–1900	9.3	69.8	93.5	67.5	40.2	23.6	12.1	2.0
1901–1910	10.1	73.1	92.5	62.5	34.9	19.4	10.7	1.7
1911–1920	9.5	74.1	93.7	61.3	33.4	17.9	9.7	1.7
1921–1930	9.7	72.4	94.7	61.5	32.1	17.1	9.1	1.6
1931–1940	13.9	95.4	123.3	77.2	38.5	18.8	9.5	1.7
1941–1950	27.5	154.7	171.2	98.0	51.6	25.4	13.5	2.4

Source: Historisk Statistik för Sverige, I, Befolkning, Tab. B 6, p. 50.

Appendix Table 2. Average age at first marriage.

Year	Males	Females
1861–70	28.82	27.12
1871–80	28.80	27.05
1881–90	28.51	26.77
1891–1900	28.78	26.84
1901–10	28.66	26.39
1911–20	29.06	26.45
1921–30	29.39	26.51
1931–40	29.44	26.50
1941–50	28.69	25.92

Source: Historisk Statistik för Sverige, I, Befolkning, Tab. B 7, p. 51.

Appendix Table 3. Median age at first marriage in Sweden for each year from 1881 to 1953.

Year	Male	Female	Age Difference
1881	27.46	25.56	1.90
1882	27.42	25.56	1.86
1883	27.41	25.54	1.87
1884	27.47	25.66	1.81
1885	27.41	25.56	1.85
1886	27.41	25.57	1.84
1887	27 35	25.64	1.71
1888	27.37	25.75	1.62
1889	27.59	25.95	1.64
1890	27.65	26.04	1.61
1891	27.75	26.02	1.73
1892	27.86	26.11	1.75
1893	27.83	26.02	1.81
1894	27.82	25.77	2.05
1895	27.79	25.66	2.13
1896	27.76	25.55	2.21
1897	27.78	25.44	2.34
1898	27.56	25.37	2.19
1899	27.38	25.18	2.20
1900	27.36	25.12	2.24
1901	26.97	25.20	1.77
1902	27.00	25.00	2.00
1903	27.17	25.14	2.03
1904	27.32	25.10	2.22
1905	27.36	25.19	2.17
1906	27.34	25.05	2.29
1907	27.26	24.98	2.28
1908	27.28	24.91	2.37
1909	27.42	25.02	2.40
1910	27.45	25.02	2.43
1911	27.45	25.15	2.30
1912	27.48	25.17	2.31
1913	27.54	25.10	2.44
1914	27.61	25.19	2.42
1915	27.67	25.16	2.51
1916	27.82	25.34	2.48
1917	27.68	25.10	2.58
1918	27.74	25.23	2.51
1919	27.84	25.26	2.58
1920	27.77	25.09	2.68
1921	27.90	25.27	2.63
1922	27.87	25.28	2.59
1923	27.99	25.34	2.65
1924	28.08	25.26	2.82
1925	28.03	25.19	2.84

Appendix Table 3.—(Continued).

Year	Male	Female	Age Difference
1926	28.08	25.20	2.88
1927	28.12	25.23	2.89
1928	28.11	25.22	2.89
1929	28.13	25.20	2.93
1930	28.16	25.20	2.96
1931	28.19	25.25	2.94
1932	28.21	25.24	2.97
1933	28.23	25.30	2.93
1934	28.31	25.39	2.92
1935	28.30	25.47	2.83
1936	28.30	25.49	2.81
1937	28.28	25.45	2.83
1938	28.21	25.36	2.85
1939	28.19	25.24	2.95
1940	27.97	24.97	3.00
1941	27.82	24.78	3.04
1942	27.73	24.66	3.07
1943	27.50	24.46	3.04
1944	27.23	24.32	2.91
1945	27.05	24.34	2.71
1946	26.91	24.31	2.60
1947	26.94	24.19	2.75
1948	26.91	24.05	2.86
1949	26.86	23.99	2.87
1950	26.88	23.93	2.95
1951	26.73	23.80	2.93
1952	26.72	23.72	3.00
1953	26.60	23.60	3.00

Sources: Sveriges Officiella Statistik, published periodically since 1857. References by year are as follows: Befolknings-Statistik: *1881*–xxiii, 7; *1882*–xxiv, 7; *1883*–xxv, 23; *1884*–xxvi, 7; *1885*–xxvii, 7; *1886*–xxviii, 27; *1887*–xxix, 27; *1888*–xxx, 27; *1889*–xxxi, 25; *1890*–xxxii, 25; *1891*–xxxiii, 28; *1892*–xxxiv, 28; *1893*–xxxv, 28; *1894*–xxxvi, 26; *1895*–xxxvii, 26; *1896*–xxxviii, 26; *1897*–xxxix, 26; *1898*–xl, 26; *1899*–xli, 26; *1900*–xlii, 26; *1901*–xliii, 25; *1902*–xliv, 25; *1903*–xlv, 25; *1904*–xlvi, 25; *1905*–xlvii, 25; *1906*–xlviii, 25; *1907*–xlix, 25; *1908*–l, 25; *1909*–li, 27; *1910*–lii, 27. Befolkningsrörelsen: *1911*–26, 27; *1912*–26, 27; *1913*–26, 27; *1914*–26, 27; *1915*–26, 27; *1916*, 26, 27; *1917*–26, 27; *1918*, *1919* and *1920*–44, 45, 46, 47, 48, 49; *1921*, *1922* and *1923*–36, 37, 38, 39, 40, 41; *1924* and *1925*–26, 90; *1926*–18, 19; *1927*–18, 19; *1928*–26, 27; *1929*–18, 19; *1930*–26, 27; *1931*–26, 27; *1932*–26, 27; *1933*–26, 27; *1934*–26, 27; *1935*–26, 27; *1936*–26, 27; *1937*–26, 27; *1938*–18, 19; *1939*–18, 19; *1940*–18, 19; *1941*–18, 19; *1942*–18, 19; *1943*–18, 19; *1944*–18, 19; *1945*–18, 19; *1946*–18, 19; *1947*–18, 19; *1948*–18, 19 ;*1949*–18, 19; *1950*–50, 51; *1951*–48, 49; *1952*–48, 49; *1953*–figures for this year are from an unpublished computation of the Central Bureau of Statistics.

SOME SOURCES OF VARIATION IN THE FAMILY SIZE OF COLLEGE GRADUATES

ROBERT GUTMAN AND IRVING BENDER[1]

A CONSIDERABLE amount of time, energy, and money has been devoted over the last two decades to the study of the social and psychological factors associated with the fertility of the American population, taken as a whole. It may seem odd, therefore, that research dealing with the social psychology of family size among college graduates should still be in an exploratory stage. This fact is especially curious when one recalls that the comparatively low birth rate of the college-educated population was one of the first topics to attract the attention of demographers early in this century. The lack of research about the sources of variations in the family size of college graduates also seems strange in view of the survey of the fertility of this group which has been conducted each year since 1946. It would appear that the authors of previous studies have been satisfied largely with demonstrating certain simple facts relating to fertility. The earliest studies, for instance, emphasized the discovery that the family size of college graduates was diminishing from 1850 onward. The most recent investigations have given all their attention to the fact that fertility in the college-educated population is now on the upswing. In other words, research has not been sufficiently concerned with understanding the phenomenon under study to raise questions about the range and distribution of the variation in the family size of college graduates. Previous studies also have failed to investigate the differences, in terms of social and psychological characteristics, between those graduates who have small families and others who have many chil-

[1] From Dartmouth College. The authors wish to express their gratitude to the Milbank Memorial Fund and the Dartmouth College Research Committee for the support which made possible the analysis of the data described in this paper; and to Drs. Clyde Kiser, Frank Notestein, and Charles Westoff for their comments on the original manuscript.

dren.[2] These are the questions which the study reported in the present paper has attempted to explore.

The sample to whose fertility behavior these questions have been addressed consists of 95 men who graduated from an eastern Ivy League College in 1940. They were chosen as subjects for the reason that a wealth of data, consisting of information on approximately forty of their social and psychological characteristics, had been collected by Bender and was readily available for analysis. Bender obtained these data while the men were still seniors in college, as part of a study he was conducting in 1939–40 dealing with the relationship between motivation in college and visual deficiencies.[3] In order to make the data usable at the present time for the purposes of the investigation reported here, the materials Bender had assembled were supplemented by means of a mailed questionnaire sent to each of the respondents in the original study, inquiring about such matters as present occupation, marital history, number of children, and other additional information. Further data from the files of the college's alumni record office were made available to the authors.[4]

In 1939–1940, Bender chose 124 seniors to serve as subjects for his research. They were selected for a variety of reasons, but when examined in terms of scholastic aptitude and performance, the group was judged representative of the entire

[2] An exception to this statement is the paper by Osborn who, in his study of Princeton alumni, compared the fertility of graduates in terms of occupation and scholastic average. *See* Osborn, John J.: Fertility Differentials among Princeton Alumni, *Journal of Heredity*, 1939, 30, pp. 565–567. Phillips, who wrote several papers on the birth rate among Harvard graduates of the nineteenth century, did, in one of his papers, relate a very crude and questionable index of vocational success to number of children. *See* Phillips, John C.: Success and the Birth Rate, *Harvard Graduates Magazine*, 1937, 35, pp. 565–570. The 1956 survey of the fertility of college graduates, conducted annually since 1946 by the Population Reference Bureau, has, for the first time since the survey was inaugurated, tried to break down the over-all results in terms of factors which may be interpreted as approximate versions of the influence of socio-economic status and religious affiliation.

[3] Bender's original study is fully described in Bender, Irving E., et al.: Motivation and Visual Factors, Hanover, N. H.: Dartmouth College Publications, 1942.

[4] Information about other aspects of fertility, including ideal family size, number of children planned, duration of marriage to first birth and between successive births was also collected. Some of the additional data are discussed in the present paper but most of them will be reported subsequently.

senior class.[5] Of the 124 subjects, 118 had survived to 1955, when it was decided to investigate their fertility. The mailed questionnaire was addressed to each one of the 118 during the late Spring of 1955, and by the autumn of the same year, when the analysis of the data was begun, 101 men, or 85 per cent of the 118 survivors, had replied. Of this latter number, 5 were still single, 1 was divorced and 95 were married. It is with these 95 men that our report deals.[6]

The Range of Family Size Among the Graduates

Within fifteen years of their graduation from college, i.e., in the Spring of 1955, the married graduates had an average of 2.43 children, with many years of fecund life still ahead of them. Of the ninety-five men, 5 still had no children, 9 had one child, 35 had two children, 33 had three, 12 had four and 1 had five offspring.

Two questions were asked of men in the sample in an attempt to estimate their *completed* fertility. First of all, they were asked what they considered their ideal family size. The distribution of their replies is given in Table 1. In terms of this question, and assuming that the stated ideal represents their own plans, the average size of the intended family was 3.14. A second question, introduced as a means of corroborating the interpretation of the responses to the question on ideal

[5] Bender, et al.: *op. cit.*, pp. 47–48.

[6] We have compared the 101 men who made returns by the time the analysis of the data was started, in the autumn of 1955, with the 118 survivors to whom questionnaires were sent. The comparison was made in terms of the following characteristics: father's occupation; parents' education; total number of siblings; religious denomination; major in college; academic standing in college; and job mobility since leaving college (information about the last factor was obtained from the alumni record office). We found no significant differences between the group of 101 men and the 118 men in terms of any of these characteristics. The 17 men who did not make returns do, however, differ significantly both from the group of 118 survivors and from the 101 men who made returns, in terms of three characteristics. Those who did not respond to the questionnaire had fewer siblings, stood much lower academically and have had much greater job mobility. In view of the results reported later in this paper, we tend to believe that these characteristics imply that the 17 men have fewer children than the sample whose fertility behavior we have investigated. Therefore, the average fertility of the married men among the 118 survivors is probably a little lower than the average of 2.43 reported for the 95 married men we have studied.

family size, inquired how many more children the respondents wanted—if they already had offspring—or how many they planned to have—if in 1955 they still had none. Table 1 also shows the results of the replies to this question. The size of the average intended family in terms of this procedure is 3.08, a result which comes exceedingly close to the answer obtained through the use of the first question.

To put it in another way, we can say that the range of fertility among the graduates, judged in terms of family size fifteen years after graduation, is from 0 children to 5 children, with the heaviest concentration in the middle of the range. If the group fulfills its plans as expressed in their responses to the questionnaire, this range will be altered somewhat, since no graduate plans to remain childless and there may be a few

Table 1. Number of children, ideal family size and intended number of children among 95 married male graduates.

Number of Children	Number of Graduates With Stated Number of Children	Number of Graduates For Whom Number of Children Represents "Ideal Family Size"[1]	Number of Graduates For Whom Number of Children Represents Intended Number
None	5	0 (0)	0
One	9	0 (1)	2
One or Two	—	2	—
Two	35	8 (20)	25
Two or Three	—	22	—
Three	33	14 (36)	31
Three or Four	—	22	—
Four	12	7 (22)	16
Four or Five	—	8	—
Five or More	1[a]	2 (6)	6
No Answer	—	10 (10)	15
Total	95	95	95

[1] In interpreting this column, it should be realized that "One or Two," "Two or Three," etc. were were stated alternatives in the question relating to ideal family size but not in the questions on which the data for number of children intended are based. If we allocate each of the "or" responses to the adjoining alternatives, *the responses in parentheses result.* For example, the figure in this column which shows that 20 respondents had an ideal family size of two children was obtained by adding to the 8 men who stated that two was the ideal family size, one-half the number of responses in the "One or Two" category, or 1 respondent; plus one-half the number in the "Two or Three" category, or 11 more men.

[a] This graduate had five children.

families with more than five offspring.[7] The average level of fertility should be more than adequate for replacement.[8]

The Factors Associated with Variation in Family Size

How do the members of the sample who have small families fifteen years after graduation differ from the men who have three, four or five children? In discussing our answers to this question, we wish to emphasize that our results are limited by the kinds of relationships it was possible for us to investigate given the fact that the available data were collected by Bender with the different purposes of his original study in mind. This has meant that certain factors which we suspected might be associated with fertility differences could not be studied, such as the influence of the wife's background and attitudes on the number of children. On the other hand, we have examined the association between fertility and a large number of variables which, had this not been an exploratory study, we might have ignored.[9]

Three different techniques of analysis were employed in studying the data, depending upon the nature of the independent variable to which fertility was being related. The following three groups of independent variables were all related to fertility by dichotomizing the variables, computing phi coefficients, and then testing the coefficients for statistical significance at the 5 per cent level of probability. The dependent variable, number of children, was also dichotomized, using respondents with "0 to 2 children" and those with "3 or more children" as the two groups.

A. Independent Variables Indicating the Social Background of the Respondent.

[7] One graduate has adopted children but he has been classified as "childless." It will be interesting to see who among those that are now "childless" will have children "naturally," or will adopt children or will never have a family.

[8] It has been estimated that an average of 2.15 children is necessary for replacement among college graduates. Population Reference Bureau, *Population Bulletin*, 1956, 12, p. 90. This figure obviously relates to all graduates, not simply married ones.

[9] Information was available about the educational experience of the wife but this variable was not significantly related to number of children. See Table 2.

1. Type of School at Which the Respondent Prepared for College. Fifteen respondents had attended a private preparatory school and 80 came to college directly from a public high school.

2. Occupation of Respondent's Father. The information relating to this variable was scanty and only two broad groups could be established: 32 respondents had fathers who were in the professions and 60 had fathers who were business men. Of the 95 men in the sample, only three had fathers whose occupations would place them below the middle class, and these respondents were excluded in the analysis of this particular variable.[10]

3. Parents' Education. For 43 respondents neither parent had attended college for any period. For 52 respondents at least one parent had spent some time in college.

4. Total Number of Siblings. Forty-eight respondents were either only children or had one sibling. Forty-one respondents had two or more siblings.[11]

5. Number of Male Siblings. Thirty-nine respondents had no brothers and 50 had one or more brothers.

6. Number of Female Siblings. Forty-seven respondents had no sisters and 42 had one or more sisters.

7. Religious Denomination. Of the ninety-five married men in our sample, 78 were Protestants, 9 were Catholics and 8 were Jews.

B. Independent Variables Indicative of the Respondent's Career in College.

1. Major Subject. Thirty-one respondents concentrated their studies in the Humanities, 10 in the Natural Sciences and 54 in the Social Sciences.

2. Extra-Curricular Activity. Fifty-four respondents engaged in fewer than four extra-curricular activities and 37 participated in four or more.

3. Academic Standing. Forty-four respondents stood in the upper half of their class and 51 respondents were below the fiftieth percentile.

[10] The reader is advised to keep this fact in mind in thinking about the implications of our results. It means that the subjects, being graduates of an Ivy League College, probably come from a higher social class than the average for college graduates of the same year in the United States as a whole.

[11] Where the sum of the men in each of the groups created by the dichotomy is less than 95, as in the case of this variable, the deficiency can be attributed to lack of information relating to the variable for some of the respondents in the sample.

C. Independent Variables Indicating the Respondent's Career Between Graduation in 1940 and 1955 Survey.

1. Job Mobility. Seventy respondents held only one or two different jobs between 1945 and 1955 while 25 respondents had held three or more jobs in the same period.

2. Civic Participation. Sixty-eight respondents participated actively in civic affairs and 27 respondents did not participate actively.

3. Wife's Education. Thirty-five respondents had wives who completed high school or attended secretarial school and 60 respondents had wives who had gone to college.

4. Church Attendance. Thirty-one respondents reported weekly church attendance and 63 reported less frequent attendance or none at all.

Table 2. Phi coefficients showing the degree of relationship between three groups of dichotomized independent variables and the number of children, also dichotomized, for 95 married college graduates.

	Phi Coefficients
A. Independent Variables Indicating the Social Background of Respondent	
1. Type of Preparatory School	−.14
2. Occupation of Father	.02
3. Parents' Education	.00
4. Total Number of Siblings	.20[a]
5. Number of Male Siblings	.16
6. Number of Female Siblings	.07
7. Religious Denomination	.21[a b]
B. Independent Variables Indicative of the Respondent's Career in College	
1. Major Subject	.04[b]
2. Extra-Curricular Activity	.01
3. Academic Standing	.13
C. Independent Variables Indicating the Respondent's Career Between Graduation in 1940 and 1955 Survey	
1. Job Mobility	−.17
2. Civic Participation	−.16
3. Wife's Education	.11
4. Church Attendance	.20[a]

[a] Coefficient is statistically significant at the 5 per cent level of probability, according to the chi-square test.

[b] The table on which this result is based had more than four cells. Consequently, the contingency coefficient, rather than the phi coefficient, was computed.

Table 2 shows the results of the analysis of the relationship between these variables and number of children, expressed in terms of phi coefficients.[12] Only three of the independent variables yield phi coefficients that are statistically significant. These are: religious denomination, church attendance, and total number of siblings. Catholics have the largest families, followed by Protestants and Jews, in that order. Those who attend church more regularly have more children. The greater the number of siblings in the family of orientation, the more children in the family of procreation.

The analysis of variance technique was used to compare six occupational groups in terms of fertility. These six groups were defined as follows:

1. Eighteen respondents who held positions in small to medium-sized family businesses which had been started by their fathers, uncles or grandfathers.
2. Thirteen respondents who ran small businesses which they had established themselves, either alone or in collaboration with one or more associates.
3. Seventeen respondents who were salaried professionals: engineers, journalists, editors, university, prep school or public high school teachers and administrators plus minor civil service officials.
4. Twelve respondents who were independent professionals: lawyers, physicians and accountants.
5. Twenty-one respondents who were executives in medium to large corporations, which were not family connected businesses, in the capacities of production manager, account executive (if the corporation was an advertising agency), personnel manager and so on.
6. Thirteen respondents who were salesmen in medium to large corporations, with which, again to the best of our knowledge, they had no family connections.

This occupational classification was developed on the basis of the data available about each member of the sample. Al-

[12] A good discussion of the virtues and also the limitations of the phi coefficient for expressing the relationships implicit in a four-cell table can be found in McNemar, Quinn: Psychological Statistics, New York, John Wiley, 1955, pp. 202–203.

though it thus has a certain specific focus, we believe it offers a promising start in dealing with the complex question of trying to find a classification of occupations which is adequate for dealing with college graduates, a group which is homogeneous in terms of the standard occupational scales used to study the national labor force. To put it in another way, we believe that the census classification of occupations in terms of "proprietors, managers and officials"; "professional and semi-professional workers"; etc. is not sufficiently refined for the men we studied, almost all of whom became either professional men or proprietors. Two factors underlie the classification used here: "opportunity for status allocation" and "total annual income." The first of these factors may be defined as the probability that a respondent's family of orientation is able to place him in an upper-class status. For instance, a graduate whose father owned a medium-sized business and who was therefore "guaranteed" a top position within its executive hierarchy would rank high in terms of "opportunity for status allocation." But a graduate who wanted to become a physician and whose father owned a small business would rank low in terms of this factor, since the father could not "guarantee" the son either admission to medical school or a successful practice.

The factor "total annual income" is self-explanatory. Relating the two factors to the six-fold classification above, we regard the respondents who hold positions in small to medium-sized family businesses as having the best "opportunity for status allocation" and "total annual income" probably somewhat above the average of the sample. The corporation executives, on the other hand, would rank considerably above the average in "total annual income" but their "opportunity for status allocation" would be less than the men who entered family businesses—assuming, as we do, that the executives obtained their jobs through their own efforts without the help of family connections. The salesmen, we suppose, are at the greatest disadvantage in terms of both factors, and this fact may go far in explaining their low fertility.

The mean number of children for each of these occupational groups was computed and the results are shown in Table 3. We find that those respondents who are members of family businesses which had been started by earlier generations and which, therefore, were "going concerns" when the respondents joined them, have the most children, an average of 3.00 per respondent. The group with the next highest fertility is that of the salaried professionals. In third position are the respondents who hold executive jobs in medium to large-sized corporations: they have 2.5 children. The independent professionals, including the physicians, have 2.17 children. Fifth position is held by the men who are members of small businesses which they themselves started. The salesmen have the lowest fertility, 1.77 children. The results are significant at the 5 per cent level of probability.

Correlation analysis was employed to study the degree of association between a battery of psychological rating scales and number of children, as well as between the number of months each respondent had been married at the time of 1955 survey and number of children. The following psychological rating scales constituted the independent variables in this analysis.

1. *Modal Ratings in Behavior Description.* This rating scale was developed by Bender as an adaptation of a similar

Table 3. Mean number of children by occupational group for 95 married male graduates.

Occupational Group	N[a]	Mean Number of Children[b]
Graduates in Small to Medium-Sized Family Businesses	18	3.00
Salaried Professionals	17	2.71
Executives in Medium to Large-Sized Corporations	21	2.52
Independent Professionals	12	2.17
Graduates in Small to Medium-Sized Businesses Started by Themselves	13	2.15
Salesmen in Medium to Large-Sized Corporations	13	1.77

[a] One graduate, now retired, was not included in this particular analysis.
[b] F for this column is 3.06 which, with n_1 equal to 5 and n_2 equal to 88 makes the results significant at approximately the 3 per cent level of probability.

form published by the Reports and Records Committee of the Progressive Education Association.[13] It provides ratings of the respondents in terms of these traits: responsibility-dependability; creativity; influence; open-mindedness; inquiring-mindedness; powers of analysis; seriousness of purpose; expressive quality; value energy; and work habits. The ratings, of course, refer to traits associated with performance in an educational setting. The students were rated by their instructors and by other educational personnel, such as deans and athletic coaches, during the course of their senior year in college. Each respondent was rated by an average of eight persons. Each trait was rated in terms of a five-point scale.

2. *Allport-Bender Rating Scale for Traits of Personality.* This was another rating scale, but one dealing with personality rather than behavior. The traits on which the respondents were rated in 1940 were these: practical intelligence; energy and purpose; emotional stability; ambition and dominance; attitude toward self; attitude toward others; and degree liked by others. Three series of ratings were obtained on each respondent: a self-rating; a rating by associates; and a rating by Bender.[14]

3. *Allport-Vernon Study of Values.* This famous test, which attempts to determine the relative importance which different kinds of values have for an individual, was given to the graduates in 1940 and to a smaller proportion of the total sample again in 1955. The values which the test attempts to measure are: theoretical, economic, aesthetic, social, political and religious.[15]

4. *Rating on Introversion-Extroversion.* A large proportion of the respondents were given Rorschach tests in 1940 and a rating for them in terms of an introversion scale based on their answers to the test was computed. In addition, Bender made his own rating of the degree to which the respondent was introverted or extroverted.

[13] Bender, et al.: *op. cit.*, pp. 23–24.
[14] *Ibid.*, pp. 24–25.
[15] *Ibid.*, p. 22.

Table 4. Pearson product-moment coefficients of correlation (r) showing the degree of association between number of children and selected independent variables for 95 married male graduates.

Independent Variable	r
1. Modal Ratings in Behavior Description	
A. Responsibility and Dependability	.02
B. Creativity	−.02
C. Influence	.14
D. Inquiring Mind	−.04
E. Open Mind	.01
F. Power of Analysis	−.05
G. Seriousness of Purpose	−.04
H. Expressive Quality	−.13
I. Value Energy	.08
J. Work Habits	.15
2. Allport-Bender Rating Scale of Traits of Personality	
A. Self-Ratings	
1. Practical Intelligence	.13
2. Energy and Purpose	−.17
3. Emotional Stability	−.12
4. Ambition and Dominance	.06
5. Attitude toward Self	−.06
6. Attitude toward Others	−.11
B. Ratings by Associates	
1. Practical Intelligence	.21
2. Energy and Purpose	.07
3. Emotional Stability	.09
4. Ambition and Dominance	.29
5. Attitude toward Self	−.02
6. Attitude toward Others	.14
7. Liked by Others	.01
C. Ratings by Bender	
1. Practical Intelligence	.08
2. Energy and Purpose	−.00
3. Emotional Stability	.09
4. Ambition and Dominance	.09
5. Attitude toward Self	.10
6. Attitude toward Others	.07
7. Liked by Others	.04
3. Allport-Vernon Study of Values	
A. Administered in 1940	
1. Theoretical	−.07
2. Economic	.10
3. Aesthetic	−.02
4. Social	.07
5. Political	.02
6. Religious	−.04
B. Administered in 1955	
1. Theoretical	.05
2. Economic	.07
3. Aesthetic	−.03
4. Social	−.10
5. Political	.19
6. Religious	−.12
4. Extroversion Score	
1. Rorschach	.01
2. Bender	.48*
5. Number of Months Married at Time of Survey in 1955	.27*

* Significant at the 5 per cent level of probability.

Table 4 gives the results of the various correlation analyses. Only two variables were found to be significantly related to the number of children of the respondents. One of these was the length of time the respondents had been married at the time of the survey in 1955, which showed an association of .2714 with fertility. The other variable was Bender's rating of the degree of extroversion, for which the correlation coefficient was .4815. The latter relationship is not so significant, in the statistical sense of this word, as might appear, since the score was available for only forty respondents.

Conclusion

On the basis of these data, what can we state are the sources of fertility differences among college graduates? Again, we wish to emphasize that our answer is subject to two qualifications. The study does not deal with completed fertility but with fertility fifteen years after graduation, which in the case of most respondents puts them in the age bracket 35 to 40. Second, the answer is given in terms of the data available to us, the nature and limitations of which should be fully clear to the reader by now.

The analysis of the data points to the influence of six factors on fertility. Catholics have more children than Protestants, and Protestants than Jews. The more regularly a graduate goes to church, the more likely he is to have a large family. (It is recognized that having a large family may encourage more frequent church attendance.) Graduates who have a greater number of brothers and sisters will themselves tend to have more children. Fertility varies significantly in terms of the following classification of occupations: men in family businesses; salaried professionals; executives in large corporations; independent professionals; men in businesses they started themselves; and salesmen. As might be expected, the longer a graduate has been married, the more likely it is that he will have a larger family. Finally, extroverts will have more children than introverts. All these relationships are statistically significant

at the 5 per cent level of probability. Whether, in turn, some or all of these factors are so interrelated that they can be reduced to a smaller number of variables than six, or even to a single basic factor, is a matter which we hope to be able to consider in a later paper.

It is striking that the measures of psychological attributes show so little relationship to fertility, but how to interpret this fact poses a problem. Does it mean, for instance, that psychological differences among college men have relatively little impact on fertility? Or is the absence of positive results due to imperfections in the test materials available to us? In subsequent analysis of the data used in this study we hope to control the influence of some of the significant sociological variables; perhaps under those conditions some of the psychological factors will show significant association with fertility, in which case we will be in a better position to decide between the alternative explanations of this curious result.

Summary

The present paper reports the results of a study of the fertility of a representative group of 95 married men who graduated from an eastern Ivy League college in 1940. Two questions have guided the study: what has been the range of variation in the fertility of the graduates to date; and what are the social and psychological factors associated with this variation?

In relation to the first question, it was found that fifteen years after leaving college, the members of the sample had an average of 2.43 children. Five men were childless and only one had as many as five offspring. If the respondents carry out their present fertility plans, they will average a little over three children per graduate. All the respondents expect to have children but few plan to have five children or more.

So far as the sources of variation in family size are concerned, six factors were shown to be positively and significantly associated with fertility. These factors were: broad religious group, church attendance, number of siblings, occupation, length of

time married and degree of personality extroversion. With the exception of the extroversion score, none of the other psychological factors on which we had information were significantly related to number of children.

In a subsequent paper we hope to report on some attempts to refine the results of the present research.

ANNOTATIONS

AGE DISTRIBUTIONS AS AFFECTED BY CHANGES IN FERTILITY AND MORTALITY—A FURTHER NOTE

THE note by Karpinos in the January issue of the *Quarterly* provides an opportunity to clarify what is and is not shown in recent analyses of the relation of mortality and fertility to age distributions.[1] I shall limit myself—as Karpinos does—to stable age distributions under various fertility and mortality schedules. Some of the recent discussion (notably Stolnitz's article and the latter part of my earlier piece) extends to other than stable distributions; but the points raised by Karpinos' note can conveniently be handled in the stable-distribution context.

The recent discussion can be divided into two major components: (a) an analytical part providing the means for determining the ultimate effect on a stable age distribution of *any* change in mortality, fertility, or both; and (b) an empirical part that, by applying techniques developed in the analytical portion, summarizes the age-distribution effects of *recorded* changes in fertility and mortality.

The main conclusions of the analytical part of the discussion are easily stated. Fertility changes have unambiguous effects

[1] Karpinos, Bernard D.: Age Distributions as Affected by Changes in Fertility and Mortality, Milbank Memorial Fund *Quarterly*, January, 1957, XXXV, No. 1, pp. 95–96; Coale, Ansley J.: The Effect of Declines in Mortality on Age Distributions. *In* TRENDS AND DIFFERENTIALS IN MORTALITY, Proceedings of a Round Table at the 1955 Annual Conference, Milbank Memorial Fund; Coale, Ansley J.: The Effects of Changes in Mortality and Fertility on Age Composition, Milbank Memorial Fund *Quarterly*, January, 1956, XXXIV, No. 1; Stolnitz, George J.: Mortality Declines and Age Distribution, Milbank Memorial Fund *Quarterly*, April, 1956, XXXIV, No. 2. *See also* the long list of citations in the Stolnitz article.

—a reduction in fertility *always* reduces the fraction at younger ages (below the mean age of a population, roughly speaking), and raises the fraction at older ages. The effect of changes in mortality, on the other hand, depends on the age composition of the changes. A uniform per cent improvement in the probability of surviving has no effect on the age distribution; above-average improvements in survivorship in infancy and early childhood have effects similar to a rise in fertility—yielding a larger fraction of young persons and a smaller fraction of older persons; while above-average improvements in survivorship at ages above 50 increase the fraction at those ages. The majority of substantial improvements can be closely represented by a uniform per cent increase in the probability of surviving at all ages, plus an excess improvement under age 5 and over age 50.[2] To ask whether an improvement in mortality of the usual form raises or lowers the fraction over 65 (with constant fertility) is to ask whether the excess improvement in survivorship under age 5 does or does not swamp any improvement over age 50. The analytical part of the discussion cannot provide an answer to this question. It can be answered only by looking at the age pattern of each mortality improvement.

A survey of 44 rather large changes in mortality risks shows that in a slight majority of cases the fraction over 65 would have been *decreased* had fertility remained at former high levels and mortality been subject to the recorded improvement. This statement would hold for Scotland 1865–1895, England and Wales 1846–1886, Berlin 1878–1901, Breslau 1883–1898, Italy 1881–1900, Switzerland 1878–1896, Germany 1905–1933, Sweden 1905–1925, Norway 1905–1925, France 1900–1935, Canada 1928–1941, United States (Death Registration Area, white population) 1900–1940, Iceland 1905–1935, Netherlands 1905–1925, Denmark 1903–1938, New Zealand 1903–1936, German Federal Republic 1946–1950, Union of South Africa (European population) 1921–1936 and 1936–1946, Japan 1923–1953, Jamaica 1921–1946, Portugal 1920–

[2] Even if the improvement in mortality departs from this pattern, its effect on the stable age distribution can be approximated by a graphical technique described in Coale, A. J.: The Effects of Changes in Mortality and Fertility on Age Composition.

1940, and Mexico 1930–1940 (a total of 23 instances).

In most other instances, a slight increase in the fraction over 65 is more than offset by a larger increase in the youngest fractions (both increases of course occurring at the expense of intervening ages) so that the median age of the stable population is lowered by the mortality improvement. Examples of this are Belgium 1846–1896, Sweden 1846–1896 and 1936–1943, Germany 1876–1896, Prussia 1856–1896, Netherlands 1846–1885, Switzerland 1905–1935, Australia 1905–1933, Scotland 1911–1931, England and Wales 1911–1931, Denmark 1938–1948, Canada 1941–1947, Trinidad and Tobago 1921–1946, British Guiana 1921–1946, Chile 1920–1940, Ceylon 1921–1952, and Taiwan 1905–1938 (a total of 17 instances).

Finally, there are a relatively few instances of large changes in mortality (for which a life-table record exists) where both the fraction over age 65 and the median age are increased. These are Norway 1936–1947, Netherlands 1936–1948, United States (white population) 1945–1952, and Republic of Ireland 1936–1946 (a total of 4 instances).

All instances of the last category of mortality improvement are found in the recent history of low-mortality areas; and this category is inevitably destined to become increasingly prominent if mortality reductions continue. There is simply no more room in the advanced countries for further substantial improvements except of the form that would produce disproportionately more old people, with only a minor offsetting effect at the young end of the age distribution.

To turn now to Karpinos' specific statements. As an analytic proposition, it is beyond dispute that an increasing proportion of aged persons can arise from decreases in mortality, fertility, or both. I would insist that a *decreasing* proportion *can* arise from decreases in mortality (but not in fertility). As an empirical generalization, it appears that the majority of the recorded large changes in mortality show a more prominent "youthening" than an "aging" effect. The most notable exceptions, however, are concentrated in the recent experience of low-mortality areas, as noted just above. I would disclaim any intention to explain the *current* aging of European and

North American stable age distributions entirely by fertility declines.[3]

I find little value in Karpinos' example (displayed in Table 1 in his note), either empirically or analytically. Its empirical value is limited by the fact that it compares mortality risks in life tables that do not represent the changing life-chances in a single real population, but rather the different life-chances in three quite different groups. One of the life tables is based on at least moderately reliable data—the table for United States white females in 1929–1931. Another—the table for United States Negro females—is based on a combination of registered deaths and enumerated population that is quite probably seriously deficient at both extremes of the age range. In other words, the detailed shape of this Negro life table is not reliable. But it is the shape that determines the age-distribution effects of shifting to another life table. The third life table in the comparison is a largely hypothetical table taken from Dublin and Lotka, LENGTH OF LIFE. It was derived by applying plausible reduction factors to the q_x values of the 1931 New Zealand life table in an effort to estimate as of 1936 what a very low mortality life table would look like. A more appropriate comparison with the 1929–1931 Negro life table is provided by a later United States nonwhite table. The table for 1949 has l_x values at ages one and 45 comparable to the 1929–1931 white life table. Moreover, the defects in an earlier table—such as the United States table for Negroes in 1929–1931—are likely to be repeated to some degree in a later table; hence the age pattern of changes is perhaps less influenced by erroneous data than when the standard of comparison is a life table with a different pattern of errors.

In shifting from the 1929–1931 United States Negro life table to the 1929–1931 white life table (with constant fertility), the fraction over 65 in the stable age distribution is substantially increased.[4] The fraction over 65 is also increased in a

[3] However, this is an example of the limitations of the stable age distribution as an analytical device. The major portions of recent *actual* increases in the proportion aged are often the result of rapid declines in fertility occurring thirty to sixty years in the past.

[4] If the shift is from the 1929–1931 Negro life table to the 1949 nonwhite table, the increase in the fraction over 65 would be reduced by more than 50 per cent.

change from the 1929–1931 white life table to Dublin and Lotka's hypothetical table. However, these facts are in no way proved (as I shall show below) in Karpinos' table or in his text.

The analytical defect in Karpinos' table is more fundamental. The columns show the rising fraction above age 65 as the intrinsic rate of increase declines with the same life table. This rising fraction is quite properly attributed to declining fertility. The rows in the table show a rising fraction above age 65 for the same r, as one proceeds to life tables with lower mortality. According to Karpinos, the increased fractions over 65 are "mainly changes due to declining mortality." Actually, when mortality improves and r is fixed, *fertility* necessarily declines. Whether the tabulated increase in the fraction over 65 is caused largely or even wholly by this change in fertility depends on the age structure of the change in mortality.

Consider the comparison shown in Table 1:

Table 1. Per cent over 65 in various stable age distributions.

	Life Table of Sweden 1891–1900	Life Table of Sweden 1946–1950
r = 0	11.83	15.43
Fertility Constant at 1896–1900 Levels	7.48	6.66
Fertility Constant at 1950 Levels	14.92	13.47

Following Karpinos' lead, we would say that the higher fractions over 65 with lower mortality and the same value of r are "mainly changes due to declining mortality." Actually, if fertility is held fixed, the later life table yields a *smaller* fraction over age 65. Hence the change shown in the table for the same value of r is caused wholly (and then some) by the *decline in fertility* required to yield a constant r with improved mortality. That the differences in his table are in fact "mainly changes due to declining mortality" is the fortuitous result of his choice of (rather non-comparable) life tables.

To summarize: Improvements in mortality *can* either in-

crease or decrease the fraction over 65, and increase or decrease the median age in stable (and actual) age distributions. Fertility reductions can *only* increase the fraction over 65 and raise the median age. Except for the last two decades of experience in relatively advanced countries, the recorded declines in mortality have tended mostly to *decrease* the fraction over 65, and in an overwhelming majority of instances to decrease the median age. Recent experience in areas with the lowest mortality risks indicates a relationship that will inevitably become the universal one (if mortality improvements continue)—a rising fraction over 65 and a rising median age caused by mortality improvement.

ANSLEY J. COALE

• • •

VITAL TRENDS AND AGE DISTRIBUTION: AN ADDED NOTE

DR. Karpinos' recent note, "Age Distributions as Affected by Changes in Fertility and Mortality," invites further comment.[1] That stable-age distributions, "though theoretical, can be advantageously utilized in general discussions on the expected effects of mortality and fertility on age structures" is readily accepted, provided their limitations are also clearly in sight. Since such distributions are inherently long-run, they provide little information or even guidance on transitions. Yet our interest as often as not is focused on 15 or 30 year consequences; indeed, most problems which have led to the postwar reexamination of the relations between vital trends and age have had just such time spans in view.[2]

The more immediate reason for the present note is to correct an apparent misinterpretation by Karpinos of his data. The variations he shows in the stable-age proportion 65 and over for varying rates of increase and a fixed life table are, as he states, the results of fertility changes alone. It is not true,

[1] Milbank Memorial Fund *Quarterly*, January, 1957, 35, No. 1, pp. 95–96.

[2] See the sources cited in my "Mortality Declines and Age Distribution," Milbank Memorial Fund *Quarterly*, April, 1956, 34, No. 2, pp. 178–215.

however, that the indicated variations for a fixed rate of increase and varying life tables reflect "mainly changes due to declining mortality." Reference to his results shows that, for each rate of increase, the proportion 65 and over rises by about 55–60 per cent when the life table for Negroes is replaced by one for whites and by 35–40 per cent when the latter is replaced by the so-called hypothetical life table. Crude but undoubtedly sufficient calculations, using procedures developed in my paper, indicate that the increases would be well below 20 per cent under either substitution, provided that fertility had really stayed constant. The explanation for the discrepancies, of course, is that replacing a higher-mortality life table by a lower-mortality one, while keeping the rate of increase constant, really implies a decline in fertility.

In short, the proper conclusions from these pure illustrations are along the lines indicated by universal experience. The emergence of mortality, rather than fertility, as the predominant cause of aging has yet to be found in any substantial segment of the world's population.

Demographic predictions are perhaps best kept unvoiced these days but two seem to me sufficiently plausible to be hazarded. In the underdeveloped areas of Latin America, Africa, and Asia, fertility should be by far the most important determinant of such aging as will be encountered over the next century as a whole. Secondly, the reverse situation is likely to develop among Western populations, and this within the foreseeable future. The circumstances which could relegate fertility to a secondary role in these areas appear quite probable. On the fertility side, it will be enough if the trends neither move markedly upward nor decline to levels implying precipitous depopulation. On the mortality side, the thing to look for is whether percentage changes in Western survival rates are tending to an age pattern which departs from the traditional one. My expectation is that where such changes have typically resembled a "reversed J" in relation to age, those of the future should increasingly approximate a J-shape. Such a shift would imply very different effects on age composition from what we have seen in the past.

GEORGE J. STOLNITZ

POPULATION THEORY AND POLICY[1]

POPULATION THEORY AND POLICY is the first of a two volume collection of papers. (Its companion, DEMOGRAPHIC ANALYSIS, is not treated in this annotation.) The book deals with the many ramifications of demographic phenomena rather than with the phenomena themselves, i.e., the data, methods, and short-range results of analysis.

The papers included in the collection were not solicited specifically for it. Rather, the editors have assembled a group of thirty-eight articles, widely diversified with respect to origin and time of publication. The vast majority of the articles were written in the United States, but contributions from Canada, Germany, Great Britain, the Netherlands, and the United Nations are also included. Twenty-eight articles were written in the decade following World War II, ten of them originated before. One, A. B. Wolfe's "The Population Problem Since The World War" was written as early as 1928. The authors represent several fields of study, e.g., economics, mathematics, and sociology. Most of the papers deal with aspects of population theory: its history, its role in relation to demographic analysis, macro and microdemographic theories, and the political, economic, and social implications of these theories. The remainder of them treat population policy. They are concerned with the objectives sought by a state as the result of the magnitude and composition of its population. Some also discuss means of implementing these objectives.

The editors of this volume have intended it to serve either as a text for a basic course in population or as a supplementary book of source materials. Unfortunately, it only partially fits the criteria for either use. As a text, it lacks sufficient introductory material to unify a course or supply the beginning student with enough fundamental theory. As a source book, it is too advanced, in spots, for the beginner, while it is not rigorous enough for the advanced student who might profit more from a comprehensive bibliography. Mechanically, the inclusion of the date and source of each paper

[1] Spengler, Joseph J. and Duncan, Otis Dudley (Editors): POPULATION THEORY AND POLICY: SELECTED READINGS. Glencoe, Illinois, The Free Press, 1956, 522 pp. $7.50.

on its title page is vastly better than the arrangement in DEMOGRAPHIC ANALYSIS. It might be even more convenient, however, if the footnotes were included at the bottom of each page instead of at the end of each article.

The book is arranged topically in nine chapters, each including several papers. The first chapter traces the development of population study. The Population Division of the United Nations reviews the condition of demographic science from its pre-Malthusian roots, stressing its interrelation with the development of statistics and the increasing importance of dynamic, as opposed to static, models of demographic growth. Wolfe's brief paper indicates the main trends of population literature and research between the world wars. The final article in this chapter, by P. M. Hauser, reviews the present condition, both substantive and methodological, of population research. It indicates a framework into which the remaining papers in this volume fall.

The second chapter, "The Role of Theory In Population Studies," is one of the most thought-provoking in the book. It deals with the role that demography can assume among the intellectual sciences, rather than with the conclusions and hypotheses of individual studies. In two excellent papers, F. Lorimer describes the levels on which social inquiry may be conducted and R. B. Vance deplores the dearth of codified theory and actual concepts in population study. However, Vance does praise the contribution of W. Willcox and F. W. Notestein toward the development of a theory that fits J. J. Spenglers' criteria of (1) being dynamic rather than static, (2) taking into account national and international demographic relations, and (3) using a multi-scientific approach.

Chapter 3 deals with macrodemography. It begins with a recent paper by K. Boulding who attempts, very vaguely, by analysis of different concepts of growth, to indicate a synthesis of these concepts into a general growth theory. O. Cogwill and A. Lotka espouse logistic theories of growth. Cogwill believes that all population growth is cyclical but that the mechanics of cycles vary according to the external influences which cause them. Lotka, on the other hand, perhaps because

of his mathematical orientation, treats population growth independently of its socio-economic causes.

The next three chapters review the economic aspects of population movements. Optimum population theory, notably the effect of given factors on the standard of living, is discussed in Chapter 4. M. Gottlieb defends the usefulness of the optimum concept and describes its measurement in an hypothetical closed economy. W. F. Ogburn suggests that although population, natural resources, economic organization, and technology all affect the standard of living, it is private ownership of the means of production combined with a high level of technological development that insures the highest standard. Spengler discusses the way in which population growth, composition, and density, themselves, affect this standard. H. W. Saunders explores the nature and effect of migration on the standard; and A. T. Peacock tries to generalize Malthusian theory by abstracting it from any particular frame of reference.

Chapter 5 treats the importance of population upon the level of economic activity. With the development of more complex tools of economic analysis, the true importance of a growing population, formerly underestimated, can be assessed. Analyses of this importance in terms of the multiplier concept, multiplier-accelerator interaction, and trade cycle theory are made by A. H. Hansen, Spengler, and A. Lösch, respectively. M. O. Brockie and C. I. Barber offer criticisms to the above analyses.

In Chapter 6 characteristics that mark "underdeveloped countries" and their populations are outlined. The relation of certain population factors, i.e., density, rate of growth, and age composition, play an important role in determining the rate of economic development. Spengler deplores the high population density in backward countries which deters economic development by encouraging the wasteful depletion of natural resources and retarding the rate of capital formation. He also presents tables summarizing the main economic and cultural differences between the relatively industrialized and non-industrialized countries. K. Davis discusses the degree and nature of agriculturalism, the necessity of continued in-

dustrialization in agricultural areas, and the role played by population control.

Chapter 7 deals with the political aspects of demography. In his paper on population and power Davis analyzes the relation of population size and composition to power. E. W. Hofstee then outlines the nature of population pressure (beyond its purely economic definition), the necessary conditions for its existence, and its effect on the future of Western Europe.

Chapter 8 deals with the socio-cultural aspects of population study. E. T. Hiller, C. L. Dedrick, and Lorimer each point out the broader merits of a cultural approach. They do this with special reference to theoretical completeness, international comparability of census data, and ability to isolate conditions which foster high or low fertility. Ogburn illustrates how the demographic and cultural approaches must complement each other to make either worthwhile. The remaining papers in the section each study a specific situation, trying to isolate single social forces of demographic significance. C. F. Westoff investigates the relation of social mobility and differential fertility. E. N. Palmer, the effect of European culture on non-European populations, and O. Durant Duncan, the implications of farm population mobility.

The concluding chapter on population policy discusses both the foundations upon which policies are laid and two current population policies. For the section on general policy formulation the editors have selected papers by Spengler, P. Meadows, Notestein, P. K. Whelpton, and D. G. Johnson. These papers deal respectively with the role of theory in formulating policy, socialized population policies, policies for areas with great population pressure, for areas with little pressure as yet, and policy aspects of mobility. W. Petersen discusses current policy in the Netherlands and the Economic Committee, Royal Commission on Population explains the economic aspects of British policy.

The papers in this volume illustrate both the excellence and deficiencies of current population study. The merits of studies which are conducted from a given point of view or which concern a single demographic phenomena are threefold. These studies tend to substantiate or invalidate a given hy-

pothesis; they serve as a basis for further study; and they are of topical interest. On the other hand, there are three serious deficiencies which deter the conduct of studies on a broader plane. There is no multilateral approach; there is no broader demographic theory on which to base such studies; and finally, there seems to be very little direct policy application of any studies. In consequence, the value of demographic analysis as a predictive or formulative tool is limited.

HOPE LAYTON FURTH

• • •

SOCIAL CHARACTERISTICS OF URBAN AND RURAL COMMUNITIES, 1950[1]

HISTORICALLY, the study of communities has been a difficult task because of the lack of specificity in census definitions regarding urban-rural residence and by incomplete census count of villages. By 1950 these problems were somewhat lessened by the development of more detailed and more realistic urban-rural categories. According to the 1950 definition, "urban" included: "(*a*) places of 2,500 inhabitants or more incorporated as cities, boroughs, and villages, (*b*) incorporated towns of 2,500 inhabitants or more except in New England, New York, and Wisconsin, where 'towns' are simply minor civil divisions of counties, (*c*) the densely settled urban fringe, including both incorporated and unincorporated areas, around cities of 50,000 or more, and (*d*) unincorporated places of 2,500 inhabitants or more outside any urban fringe." (p. 371) The 1950 Census reports also brought three innovations in classification of communities by size.

> In the first place, the classification makes use of the new concept of 'urbanized area'. . . . Second, by regarding each urbanized area as a single 'place,' the classification groups together as one unit, the large central city (or cities) and its suburban and urban fringe areas. . . . Third, the size-of-place classification is carried

[1] Duncan, Otis Dudley and Reiss, Albert J., Jr.: SOCIAL CHARACTERISTICS OF URBAN AND RURAL COMMUNITIES, 1950. New York: John Wiley & Sons, Inc., 1956. (London: Chapman & Hall, Limited.) 421 pp. $6.50.

> below the urban level to include villages 1,000 to 2,500 and under 1,000 in population size. (pp. 22–23)

With the aid of new data and new tools, Duncan and Reiss are able to offer a monograph which represents a major contribution to the study of communities. The monograph is written in four parts each one representing an independent variable. The independent variables considered are: size of communities, spatial organization of communities, community growth and decline, and functional specialization of communities. The dependent variables are age and sex composition, race and nativity composition, marital status and family characteristics, mobility, education, labor force participation and occupation, and income.

In the first part of this monograph the authors are concerned with the relationship of the dependent variables to size of community, the first independent variable mentioned above. Some of the major findings are: there is very little variation in the sex ratio by size of place, but the sex ratio for the West is higher than that for any other region and this tends to persist by size of place; the median age for the United States is directly related to size of place and ranges from 26.1 to 33.7 for the categories used; and fertility ratios (children under 5 years old per 1,000 women) are inverse-related to size of place. In the Northeastern region of the United States the fertility ratio for urbanized areas of 3,000,000 or more is 419, for urbanized areas of under 250,000 it is 481, and for places outside urbanized areas of 2,500 to 10,000 it is 512.

The race-nativity classifications considered here are: native white, foreign-born white, Negro and other races. There is a general tendency for the proportion of the native-white population to be inversely related to size of place; the percentage Negro shows a direct relationship when analyzed by size of place for the Northeast, Northcentral, and West; and the largest percentage (26.1) Negro is found in the Southern farm areas. The marital status of males (14 years old and over) shows no pattern when considered by size of place, but the marital status of females, namely, "ever married" females, is inversely related to size of place.

Between 1949 and 1950 the nonfarm areas experienced a gain of 700,000 migrants from farm areas. The rate of in-movement from farms, i.e., movers from farms per 1,000 resident population 1 year old and over, is inversely related to size of place. The rate for urbanized areas of 1,000,000 to 3,000,000 is 3.3 per 1,000, for places outside urbanized areas of 10,000 to 25,000 is 15.4 and for other rural non-farm 37.4.

The data for median years of school completed by size of place are presented by color and region. For the United States the highest (10.9) median years of school completed for persons 25 years old and over is that for white persons living in urbanized areas of 250,000 to 1,000,000. The nonwhite male population 25 to 44 years old exhibiting the highest (10.8) median years of school completed is that in the Western urbanized areas of 3,000,000 or more.

In Part II, the authors explore the social morphological differences of the suburbs and urban fringe areas in contrast with central cities, rural-urban fringe of a major city, the metropolitan suburbs in contrast with independent cities, and the urban influences on rural population characteristics (or the spatial organization of communities). The outlook of the authors is that the suburb is a specialized area within a larger economic city and cannot be compared with independent cities of similar size without regard to the factors which differentiate suburban and nonsuburban places. Suburbs differ systematically from central cities with regard to characteristics related to family organization and functions. This relationship does not seem to be obvious when applied to all economic characteristics. For instance, the median income in 1949 of all persons 14 years old and over is $2,249 for central cities and $2,499 for suburbs and fringe areas.

For the analysis of the rural-urban fringe of a major city, Chicago was chosen. The results of the Chicago study seem to indicate the advisability of distinguishing between the rural-urban fringe population and other components of the urban and rural populations. Chicago's suburban and urban-fringe area as a whole exhibits characteristic differences from the central city similar to those observed between all suburbs and central cities of the United States. For several population

characteristics the central city exhibits one extreme value, the suburbs an intermediate value, and the urban and rural-nonfarm fringes the other extreme value. The sex ratio for Chicago city is 96.4, for suburbs of 50,000 or more 97.9, and for the urban fringe 106.8. The metropolitan suburbs when contrasted with independent cities show clear-cut differences in population and socio-economic characteristics. Part of these differences can be accounted for by the proximity of metropolitan suburbs to large cities. The metropolitan suburbs seem to enjoy a higher socio-economic status than independent cities. For metropolitan suburbs of 25,000 to 50,000 the median years of school completed for persons 25 years old and over in 1950 was 10.8, the per cent enrolled in school (persons 20 to 24 years old or college age level) was 11.8, the median 1949 income of families and unrelated individuals was $3,389 and the per cent of occupied dwelling units ownership was 56.3; for independent cities of the same size the figures were 10.1, 10.0, $2,682 and 53.8, respectively.

Part III deals with the question, "What characteristics are related to the growth and decline of communities?" The data available do not permit the analysis of *causes* of growth and decline of a community. The question can only be studied through a comparison of "high growth rate" and "low growth rate."

The characteristic most closely related to growth and decline of communities is socio-economic level. This can be seen in the higher percentage (39.7) of men in white-collar occupations for standard metropolitan areas of 250,000 or more exhibiting a high growth rate as compared with 33.2 for SMA's of 250,000 or more exhibiting a low growth rate. The difference is even more striking when central cities of 100,000 or more having a high growth rate and low growth rate are considered. In cities of this size having a high growth rate the percentage of men in white-collar occupations is 43.8, and 33.4 for those having a low growth rate. Median years of school completed and per cent of home ownerships show similar results. The data for median income do not present as uniform a set of findings. There is a direct relationship between employment in manufacturing and low growth rate communities.

Part IV of this monograph is concerned with the classification of communities according to functional specialization (involvement in an economic activity for which there is an export function). The major functional specialization classifications are manufacturing, wholesale and retail trade, higher education, public administration, transportation, military national defense, and entertainment and recreation.

This part of the monograph is concerned with the relationship between degree of specialization and the demographic, economic and socio-economic characteristics of communities. Some of the major findings of communities classified as specializing in manufacturing are as follows: Central cities of 100,000 or more having a high degree of manufacturing specialization have proportionately more (69.5) persons 21 years old and over than do central cities having a low degree of specialization (67.6); the rate of labor force participation, for males, is greater in central cities, suburbs, and independent cities which specialize in manufacturing than in those which do not, regardless of size of place; manufacturing communities have a lower general socio-economic level, but a somewhat higher average income level; and manufacturing cities of 100,000 or more have a median income of $3,188, in contrast with 2,506 for nonmanufacturing cities of the same size.

In the chapter on characteristics of trade centers, Duncan and Reiss subdivide trade centers into: wholesale trade centers, retail trade centers, wholesale and retail (combined) trade centers, maintenance trade centers, and nontrade centers. Retail trade centers and trade centers are found to have (a) older populations, (b) smaller households, (c) greater labor force participation rates for women, but not for men, (d) higher percentage enrolled in college, (e) higher proportions of employed males in hotels and lodging places, and (f) higher proportions of employed males in entertainment and recreation service than wholesale trade centers, maintenance trade centers and nontrade centers.

The minor types of specialization considered are higher education, public administration, transportation, military installations, and entertainment and recreation. Clearly defined results are not possible in areas of minor specialization because

(a) specialization of a minor type employs a smaller segment of the population than major specialization; and consequently exercises less influence on the social morphology of an urban place, and (b) regional location of places with minor types of specialization are not comparable to all places of the same size and metropolitan status.

SOCIAL CHARACTERISTICS OF URBAN AND RURAL COMMUNITIES, 1950, is one of a series of census monographs sponsored by the Committee on Census Monographs of the Social Science Research Council. It is both a continuum and an addendum to Ogburn's SOCIAL CHARACTERISTICS OF CITIES. The reading is slightly tedious in parts but the effort is well rewarded. In the opinion of this reader the monograph presents a very favorable argument for supplementary census tabulations by the size of the community rather than the simple trichotomy of urban, rural nonfarm, and rural farm. The classifications now in existence leave much to be desired. While the cost of more elaborate tabulations, in comparison with existing ones is high, the knowledge to be gained will more than recompense the cost.

ADRIENNE P. HAINE

BOOKS

In Collaboration with the Milbank Memorial Fund

Approaches to Problems of High Fertility in Agrarian Societies. 1951 Annual Conference of the Milbank Memorial Fund, 1952. 176 pages. $1.00.

Backgrounds of Social Medicine. 1947 Annual Conference of the Milbank Memorial Fund, 1949. 294 pages. $1.00.

Biology of Mental Health and Disease. Proceedings of the Round Table on Biological Aspects of Mental Health and Disease. 1950 Annual Conference of the Milbank Memorial Fund. New York, Paul B. Hoeber, Inc., 1952. 720 pages, 218 illustrations. $10.00.

Current Research in Human Fertility. 1954 Annual Conference of the Milbank Memorial Fund, 1955. 163 pages. $1.00.

The Elements of a Community Mental Health Program. 1955 Annual Conference of the Milbank Memorial Fund, 1956. 248 pages. $1.50.

The Family as a Unit of Health. 1948 Annual Conference of the Milbank Memorial Fund, 140 pages. $0.50.

Family Health Maintenance Demonstration, The. A controlled, long-term investigation of family health. Proceedings of a Round Table at the 1955 Annual Conference of the Milbank Memorial Fund, 1956. 251 pages. $2.00.

Interrelations between the Social Environment and Psychiatric Disorders. 1952 Annual Conference of the Milbank Memorial Fund. 1953. 268 pages. $1.50.

Interrelations of Demographic, Economic and Social Problems in Selected Underdeveloped Areas, The. Proceedings of a Round Table at the 1953 Annual Conference of the Milbank Memorial Fund, 1954. 200 pages. $1.00.

Modernization Programs in Relation to Human Resources and Population Problems. 1949 Annual Conference of Milbank Memorial Fund, 1950. 154 pages. $0.50.

Nature and Transmission of the Genetic and Cultural Characteristics of Human Populations, The. 1956 Annual Conference of the Milbank Memorial Fund, 1957. 164 pages. $1.00.

Newer Population Research. By P. K. Whelpton. Lancaster, Pennsylvania, The Science Press Printing Company, 1950. 212 pages. $1.00.

Nutrition in Relation to Health and Disease. 1949 Annual Conference of the Milbank Memorial Fund. 1950. 252 pages. $1.00.

Problems in the Collection and Comparability of International Statistics. 1948 Annual Conference of the Milbank Memorial Fund. 168 pages. $0.50.

Programs for Community Mental Health. 1956 Annual Conference of the Milbank Memorial Fund, 1957. 224 pages. $2.00.

The Promotion of Maternal and Newborn Health. 1954 Annual Conference of the Milbank Memorial Fund, 1955. 229 pages. $1.50.

Research in Public Health. 1951 Annual Conference of the Milbank Memorial Fund. 1952. 294 pages. $1.00.

Social and Psychological Factors Affecting Fertility. Volumes II, III, and IV. New York Milbank Memorial Fund, 1950, 1952 and 1955. $1.00 each.

Trends and Differentials in Mortality. 1955 Annual Conference of the Milbank Memorial Fund, 1956. 168 pages. $1.00.

BUSINESS PRESS, INC.,
LANCASTER, PA.